The Integration of Nature-Based Learning at an Urban Independent School over the Course of a School Year

By

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for

Montcrest School

in collaboration with

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Executive Summary

The purpose of the present study is to explore the process of integrating Nature-Based Learning (NBL) at Montcrest School over two phases: a baseline phase in the Fall of 2014 and an implementation phase starting in January 2015. The aim of the project was to look at the current state of NBL in the school, as well as to identify supports and barriers to further integrating NBL. Seven staff members were administered a semi-structured interview protocol during the baseline phase, while four of the same staff members were administered a similar protocol during the implementation phase, and audio recordings were produced with a digital audio recorder. Transcriptions were coded and analyzed so that the resulting themes and meta-themes could help to answer the study questions of describing the current level of NBL at Montcrest School, as well as identifying supports and barriers to further integration of NBL.
Acknowledgements

A huge thank you is in order to David Thompson, whose insight and patience in enabling such a project has been critical to the development of this study and my work. Many thanks to the board at Montcrest for facilitating efforts in research and outdoor education, and to the donors who enabled such work through the Imagine Fund. Thanks to Stephen Fine for his interest, encouragement, and keen insights in the development of research. Thanks to Hilary Inwood at OISE whose guidance and support has been instrumental in the development of my professional capacity. Thanks to the staff at Montcrest for their support in my new role, especially to those dedicated staff members who contributed their time and wisdom as participants. Many thanks to the Council of Outdoor Educators of Ontario for providing a community to share ideas with and providing a viable venue for learning. Thanks to my incredible wife, my family, and my friends for the emotional support and guidance. Finally thanks to all my teachers, camp counselors, colleagues, students, and campers who’ve helped me develop my identity as a teacher and researcher: I can only hope to give my future students as much guidance as you’ve given me.
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Chapter 1: INTRODUCTION

1.1 Introduction to the Research Study

In recent years there has been an increasingly evident disconnection between humanity and nature, seen most alarmingly through children and adolescents. In Last Child in the Woods: Saving our Children from Nature Deficit Disorder (2005), Richard Louv coined the phrase “Nature Deficit Disorder” (NDD) to highlight the importance of connecting with nature for modern mental health. Although NDD depicts more of an epidemic than a disorder, it is useful in describing decreases in physical activity, time spent outdoors, natural eating habits, and ecological knowledge, along with increases in mental and physical health disorders, media use, and prescription medications (Louv, 2005). NDD is useful in aligning trends in the disconnection from nature to trends involving the increase in attention disorders such as Attention Deficit Hyperactivity Disorder (ADHD), for which recent research suggests symptoms can be alleviated by time spent in natural surroundings (Taylor, Kuo, & Sullivan, 2001; Kuo & Taylor, 2004; Taylor & Kuo, 2009; Van den Berg & Van den Berg, 2011). Louv recently coined another pertinent phrase, the “Nature Principle” in his book The Nature Principle: Human Restoration and the End of Nature Deficit Disorder, which suggests that “the more high-tech we become, the more nature we need” (Louv, 2012). Louv’s diligence in gathering research on NDD through the Child and Nature Network has been vital in launching a worldwide movement to reconnect youth with nature. Along with an identification of the need for a deeper connect to nature in individuals’ lives, research organizations and governments have been active in promoting the benefits of developing children’s connection to nature through environmental education.
Montcrest School is a co-educational, independent school located in Toronto which provides for children from junior kindergarten to Grade 8. There are over 300 students, and around 40% have individual assessments consisting predominantly of learning disabilities, attention disorders, and psychosocial needs. The school is located near the Don Valley, Riverdale park, and the Evergreen Brickworks, a central environmental educational hub in Toronto. There has been some effective development of NBL initiatives over the years, as well as a drive to create opportunities for research involving NBL adding to its capacity to be a leader in outdoor and environmental education.

The purpose of this study is to document current outdoor and environmental education initiatives taking place at Montcrest school, as well as gather staff perspectives from both the baseline phase and the implementation phase of the project. The study will seek to identify existing barriers and supports to the integration of NBL in the school, as well as gain solutions through both the participants’ suggestions and the research process.

1.2 Research Questions

Three questions were answered through the study: 1) What are some of the elements that foster NBL within the school curriculum and programming from staff perspectives? 2) What are some of the barriers to integrating NBL within the school curriculum and programming from staff perspectives? 3) What are some of the supports that enable the integration of NBL within the school curriculum and programming from staff perspectives?
1.3 Background of the Researchers

J. Benjamin Blakey has a leadership background working in summer camps and outdoor education programs, allowing him to see how contact with nature offers many positive outcomes for children and adults with respect to learning and mental health. After studying psychology in an undergraduate degree, he did consulting work using psychology and education, focusing in particular on NDD and ecopsychology. He recently completed a Masters level teaching certification program with a research component, and his thesis work in the program made him more aware of policy documents, educational research, and the gap that exists regarding the implementation of NBL at various levels of the education system. His work as a camp counselor, teacher, and consultant fosters his belief of the critical importance for 21st century thinking to involve the integration of nature within education.

Stephen M. Fine, Ph.D., received his doctorate from the Ontario Institute for Studies in Education of the University of Toronto in 2005, and is a curriculum specialist with a background in environmental studies (MES York, 1994). As both a youth development professional and an independent researcher, Stephen’s interests include intra-group dynamics, learning in context, learning transfer, and biological conservation. He is the founder and co-director of The Hollows Camp, an outdoor learning centre and summer camp in southern Ontario. Additionally, he is the current Research Co-chair for the International Camping Fellowship, National Research Chair for the Canadian Camping Association, and ex officio member of the American Camp Association's Committee for the Advancement of Research and Evaluation. He lives year round on-site at The Hollows Camp and enjoys canoeing and kayaking, as well as Nordic and alpine skiing.
Chapter 2: LITERATURE REVIEW

Ecopsychology

Recent research in the fields of ecopsychology or environmental psychology have been documenting the myriad of beneficial effects of ‘contact with nature’ on various populations of adults and children (Selhub & Logan, 2012). In the current study “contact with nature” can be defined in terms of 3 levels: viewing nature, being in the presence of nature, and engaging actively in nature (Stone, 2006). “Nature” can be defined as “an organic environment where the majority of ecosystem processes are present (e.g. birth, death, reproduction, relationships between species)” (Maller, Townsend, Pryor, Brown, & St. Leger, 2006). The term Nature-Based Learning (NBL) is also used to describe learning opportunities involving contact with nature.

Although psychologists and mental health professionals have embraced the healing power of contact with nature since the turn of the 20th century, it was not until the 1970s through psychology that scientists began to more fully explore the role of contact with nature in the evolution of humanity. Several reliable theories have emerged to explain the effects of contact with nature on mental processes, most notably the more theoretical “Biophilia hypothesis” which suggests that we’ve evolved with an innate need to connect with other life (Wilson, 1984). The more empirically-validated Attention Restoration Theory (ART; Kaplan & Kaplan, 1989) and Psycho-Evolutionary Theory (PET; Ulrich, 1983) have also been useful in conceptualizing benefits from contact with nature to attention and stress, respectfu
Evidence for NDD

Though describing trends related to NDD is difficult with our current system for understanding science based on scientific reductionism, there are many studies that document the disconnection in terms of decreases in physical activity (U.S. Centres for Disease Control and Prevention, 2002; Nader, Bradley, Houts, McRitchie, & O’Brien, 2008), time spent outdoors (England Marketing, 2009; Pergams & Zaradic, 2006; 2008; Outdoor Foundation, 2010), ecological knowledge (Balmford, Clegg, Coulson, & Taylor, 2002; Bebbington, 2005; Airbus, 2009), as well as environmental attitudes (Wray-Lake, Flanagan, & Osgood, 2009). There are related increases in media use (Balmford et al, 2002; Bebbington, 2005; Roberts, Foehr, & Rideout, 2005; Vandewater, Rideout, Wartella, Huang, Lee, & Shim, 2007), physical ailments (Troiano, Flegal, Kuczmarski, Campbell, & Johnson, 1995; Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006; Lovasi, Quinn, Neckerman, Perzanowski, & Rundle, 2009; Rose, Morgan, Ip, Kifley, Huynh, Smith, & Mitchell, 2008), psychological diagnoses (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007; Collins, Westra, Dozois, & Burns, 2004), and prescription medications (Mayes, Bagwell, & Erkulwater, 2008). NDD is particularly important in light of the Biophilia hypothesis, which suggests that as we detach ourselves from the natural environment we lose the genetically-endowed benefits of interacting with nature, inviting less desirable mental and physical health outcomes (Besthorn & Saleeby, 2003). Zaradic & Pergams (2007) use the term “Videophilia” to describe the rapid increase and attachment to media technology, which in turn may be affecting our species’ evolution.
Evidence for Children’s Contact with Nature

A number of studies describe children’s contact with nature in terms of an array of the mental health benefits, as well as in fostering environmental attitudes. Systematic reviews of a collection of studies have demonstrated that there are a range of cognitive health and learning benefits from children’s contact with nature, particularly for those with special needs (Pretty, Peacock, Hine, Sellens, South, & Griffin, 2007), as well as that children who spend more time outside are less sedentary, engaging in more cardiorespiratory fitness (Gray, Gibbons, Larouche, Sandseter, Bienenstock, Brussoni, Chabot, Herrington, Janssen, Pickett, Power, Stanger, Sampson, & Tremblay, 2015). Studies of children’s proximity to greenspace have described increased cognitive functioning and attention after moving to a new home with more natural surroundings (Wells, 2000), as well as increased physical activity in residential areas with more greenspace (Cohen, Ashwood, Scott, Overton, Evenson, Staten, Porter, McKenzie, & Catellier, 2006; Scott, Cohen, Evenson, Elder, Catellier, Ashwood, & Overton, 2007; Babey, Hastert, Yu, & Brown, 2008), an important and highly related factor which has profound effects for learning and mental health (Ratey, 2008). An interesting line of research that aligns with NDD looks at the benefits of children’s contact with nature for those who have ADHD (Taylor, Kuo, & Sullivan, 2001; Kuo & Taylor, 2004; Van den Berg & Van den Berg, 2011), such that one study showed reductions in children’s ADHD symptoms after a twenty minute walk in the park as contrasted with an urban and a residential walk, which was comparable to reported effects from methylphenidates (Taylor & Kuo, 2009).

Several retrospective studies have described how childhood experiences in nature engender adult environmental attitudes and behaviours (Chawla, 1998), as well as a more
positive outlook for nature (Thompson, Aspinall, & Montarzino, 2008), especially for experiences involving more ‘wild’ nature as opposed to ‘domesticated’ nature (Bixler, Floyd, & Hammit, 2002; Wells & Lekies, 2006). Studies of children’s unstructured free play in nature have demonstrated a range of cognitive, social, and emotional benefits (Burdette & Whitaker, 2005), and natural playgrounds in schools have been shown to encourage more non-competitive play as well as more light-to-moderate physical activity (Bell & Dyment, 2006). One study showed that while participation in an environmental education program increased students’ environmental knowledge, it was the direct field experience in contact with nature that engendered environmental attitudes (Duerden & Witt, 2010).

A recently released evidence-informed position statement on active outdoor play reads “access to active play in nature and outdoors – with its risks – is essential for healthy child development. We recommend increasing children’s opportunities for self-directed play outdoors in all settings – at home, at school, in child care, the community and nature” (Tremblay, Gray, Babcock, Barnes, Bradstreet, Carr, Chabot, Choquette, Chorney, Collyer, Herrington, Janson, Janssen, Larouche, Pickett, Power, Sandseter, Simon, & Brussoni, 2015). This document includes the combined efforts of many different organizations and individuals, lending support initiatives at Montcrest School in allowing students more opportunities for active outdoor play.

*Integrating Environmental Education*

Three recent documents from the government of Ontario have been created for educational policy, namely *Shaping Our Schools, Shaping Our Future: Environmental Education in Ontario schools* (MOE, 2007), *Acting Today, Shaping Tomorrow: A Policy*
Framework for Environmental Education in Ontario schools (MOE, 2009), Environmental Education: Scope and Sequence of Expectations (MOE, 2011) as there is a need to connect children with the environment both for mental health and learning, as well as for global environmental concern. The first ministry document, Shaping Our Schools, Shaping Our Future, defines “environmental education” as

“education about the environment, for the environment, and in the environment that promotes an understanding of, rich and active experience in, and an appreciation for the dynamic interactions of the Earth’s physical and biological systems, the dependency of our social and economic systems on these natural systems, the scientific and human dimensions of environmental issues, and the positive and negative consequences, both intended and unintended, of the interactions between human-created and natural systems,” (p. 6).

This is a broad but integrated definition that connects well with this study’s definition of ‘contact with nature’ in that it promotes not only sustainability thinking but also emphasizes rich and active experience in nature. The document contains a vision statement that discusses that “while environmental education rests on a foundation of knowledge from both science and social studies/geography, this knowledge will be applied across the curriculum. Environmental education will be reflected in an age-appropriate way throughout the curriculum through strands, topics, and expectations, and will be recognized as a provincial priority” (p. 5).

A relevant study investigated the influence of school culture on the integration of environmental education at a private school in Georgia (Schumacher, Fuhrman, & Duncan, 2012). Seven participants were selected with help from administration to represent those in favour of environmental education and those opposed, and a qualitative analysis of audio interviews revealed 5 themes for the results: characteristics of the school, resources, incentives, barriers, and the perspective of administration. School
characteristics included support from teachers, parents, and administration, freedom for curricular exploration, collaboration amongst teachers, a research-based mentality, and an integrated curriculum, while resources included the local environment, monetary resources, and equipment. Incentives included teachers’ positive perceptions, as well as recognition from administration, and barriers included a lack of time, interest, or comfort with subject material, workplace politics, safety concerns, and worry of outdoor distractions. The perspective of administration included deciding to prioritize environmental education, providing professional development, being permissive of creativity in outdoor classes, collaboration, property and resources, integration with the curriculum, and incentives.

Recent initiatives have also been created alongside research and policy in Ontario, such as the Toronto District School Board (TDSB) Ecoschools and Ontario Ecoschools initiatives. There are also organizations including Evergreen, the David Suzuki foundation, and the PINE project which have done a lot to change the educational landscape in Toronto and Ontario in terms of the awareness of the importance of environmental education in developing students’ connection to nature.
Chapter 3: METHODOLOGY

3.1 Procedure

This exploratory case study takes an epistemological position of social constructivism (Denzin & Lincoln, 2011; as cited in Creswell, 2013) due to the approach in looking at the complexity of individual perspectives and situating their knowledge within social and historical contexts. The current approach looks at the many complex facets of schools in order to understand and describe staff perspectives of the integration of nature at Montcrest School. The researcher used transcriptions of interviews primarily, along with written observational reflective memos, and files obtained from participants in order to interpret staff perspectives on the integration of nature within the school.

All participants gave informed consent for participation (see Appendices), after which interviews were conducted while recording. Audio interviews were transcribed, and all files were kept on a secure computer. The purpose is to describe the integration of nature in the school currently, as well as identify supports and barriers to increasing the integration of nature.

3.2 Instruments of Data Collection:

Three semi-structured interview protocols were used for data collection. The baseline phase teacher interview protocol (see Appendix A) contained 20 major open-ended questions while the baseline phase staff protocol (see Appendix B) contained 16 major open-ended questions. The implementation phase teacher interview protocol (see Appendix C) was modeled after the baseline phase teacher protocol and contained 20 major open-ended questions. Minor questions were included and were asked if the participant did not refer to the question in their initial response. Questions were designed
to allow a substantial degree of flexibility in responding, such as “could you describe your observations about the influence that nature-based learning activities have on your students?” If participants were unable to answer, then more specific questions were asked, such as “if you’ve been able to build in nature-based learning experiences, could you describe how your students’ nature-based learning experiences affect their Emotional Control, Response Inhibition, or Sustained Attention?”

3.3 Participants

Participants for the baseline phase included seven staff at the school, with 6 teachers and one administrative staff member who were all working at the school during the 2014/15 year. Participants for the implementation phase included four of the same teachers. All participants had teaching degrees and had previously taught a variety of grades and subjects, and work experience at Montcrest School ranged from eight to seventeen years. Teachers for the baseline phase were selected by the researcher from a larger pool of teachers on a list created by the head of school, in order to keep their confidentiality from both the head of school and others. Staff were selected to include each of the 3 divisions (primary, junior, senior), as well as the perspectives of homeroom teachers, specialist teachers, and one administrator. Specializations and subjects taught for those involved in the baseline phase included science, health and physical education, languages, math, art, social studies, and drama. Participants for the implementation phase were recruited by asking those from the baseline phase who were remaining at the school for the 2015/16 year if they’d take part in another interview in June, of which four of the original participants made time to meet with the researcher. Participants from the
The Integration of Outdoor and Environmental…

implementation phase included at least one member from each of the three divisions along with perspectives of homeroom teachers and specialist teachers.

3.4 Data Collection and Analysis

A digital audio recorder was used to tape dialogue between the researcher and the participants. Interviews were transcribed then analyzed according to themes and coded across transcripts in order to most accurately describe the data. Quotes taken directly from the interviews are used in the analysis in which the letter “I” is used to describe the interviewer and the letter “P” is used to describe the participant.

Themes and meta-themes were created in order to reflect the construction of the interview protocol, the questions of which were linked with current research and modeled in part after the study by Schumacher et al (2012). Meta-themes arose out of the themes in terms of the organization of participants’ dialogue, and out of a process of going back and forth between codes, themes, and meta-themes in order to accurately reflect the data. Table 1 lists the meta-themes and themes from the baseline phase, while Table 2 lists the meta-themes and themes from the implementation phase.

3.5 Ethical Review Procedures

The study has met ethical considerations in accord with the Tri-Council Policy: Ethical Conduct for Research Involving Humans.
Chapter 4: FINDINGS

Transcription of interviews were coded and grouped into themes. Five metathemes were identified from the baseline phase: 1. Staff Connection to Nature, describing participants’ connections to nature both personally and professionally; 2. Observed Influence of NBL on Students, touching on participants’ views of students’ experiences involving NBL; 3. Supports and Barriers to the Integration of NBL, highlighting participants’ views of helpful factors and hindrances to integrating NBL in the school; 4. Process of Integrating NBL in Curriculum and Programming, describing some of the changes and ideas that have helped to integrate NBL; and 5. Applicability of NBL to Curriculum and Teaching, including participants’ understanding of the relatedness of NBL to curriculum across grades and subjects. See Table 1 for a breakdown of the themes and meta-themes from the baseline phase. Three meta-themes were identified from the implementation phase: 1. Teacher-Based Supports for NBL, discussing available supports to teachers; 2. Community-Based Supports for NBL, suggesting helpful factors from others in the school community; and 3. Barriers to Integrating NBL, identifying perceived barriers to integrating NBL in the school. Table 2 shows the themes and meta-themes for the implementation phase. The researcher’s observational notes are included at the end of each results section to compliment existing data.
Table 1: Metathemes & Themes for the Baseline Phase

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4.1.1 Staff Connection to Nature

4.1.1.1 Personal Connection to Nature

Several participants discussed spending a large amount of their free play time outdoors with a variety of activities as children, while a few mentioned how their connection to nature was stronger during their childhood. Most participants suggested that they currently had a strong connection to nature and gained cognitive benefits from outdoor activities, while a few described how other staff also valued their outdoor time. Several participants suggested they enjoyed being with students outdoors as they were
able to see them in a different setting, and how most staff appreciated the value of bringing students outside but that some were more comfortable than others. Teachers suggested that their comfort and confidence levels in taking classes outdoors were relatively high. Several mentioned having no trouble asking for outdoor support and getting it, while one suggested that their levels of comfort and confidence depended on the activity and availability of support. Several participants described how they were interested in future NBL opportunities with the school, and that they wanted to work toward getting students outside. As one participant suggested,

“I’m excited about it I have to tell you I’m a little bit nervous because it’s not my strength, I love nature and I think it’s so good to take the kids outside but I’m nervous for me because I don’t know yet how it’s going to look… I’m definitely willing to do it and I wanna work towards it.”

4.1.1.2 Family Connection to Nature

Several participants mentioned how they had spent time outdoors with family during their childhood, while a few participants discussed their partners’ connection to nature and its impact on their own. Several participants desired their family to have a strong connection to nature, though one mentioned that their families’ connection was not strong. A few participants also discussed wanting to foster their children’s connection to nature, and one mentioned seeing differences in their child outdoors. As one participant described, “I see the difference in my own child taking him out and he’s a homebody, so you have to drag him out a little bit, but when he goes out it’s just a whole different experience.”
4.1.1.3 Professional Background Related to Nature

Several participants mentioned having training including teaching qualifications, learning from Outward Bound, and leadership experiences at summer camps. A few mentioned past opportunities to take students outdoors for classes in other schools, as well as mentioning experiences at the current school in taking students outside for classes, extracurricular activities, and school-wide events in the park. As one participant described,

“I ended up being on staff [at camp] for about five years or so it was a stretch of probably around ten or fifteen years when I was at camp, that was probably the most important part of my life and I look back on it as the best thing I ever did.”

4.1.1.4 Philosophy of Education Related to Nature

A few participants suggested that it was important to support kids and adults being outdoors, while one suggested that students should have a well-rounded education including outdoor education, and another mentioned the value in letting kids play outdoors in light of global concerns about children’s safety. Several participants mentioned educational interests including allowing for unstructured exploration in primary grades, teaching real life lessons outdoors, and fostering students’ desire for exploration through science and language. A few participants mentioned valuing learning environmental knowledge and allowing for interactions with different species, as well as fostering a love and respect for nature. As one participant described,

“my goal would be to give students a really good appreciation of nature and respect for nature, whether I teach specifics so much or not, I really want that respect there and knowing that they’re part of nature that connection.”
4.1.2. Observed Influence of Nature on Students

4.1.2.1 Influence of Nature on Student Behaviour

Several participants described how being outdoors helped students cope with anxiety and calm themselves down, while one mentioned how nature was useful in augmenting students’ energy. Several participants mentioned how nature engaged creativity and imagination, and one suggested that this was due to their being less limited, more open, and free. Several participants discussed how students were more enthusiastic and enjoyed learning more outside, and one participant described how students often lost track of time, becoming immersed in their activities outdoors. One participant mentioned how outdoor activities deepened learning which sometimes led to ‘ah-ha’ moments, while another suggested that outdoor games made it often more real for students. Several participants suggested that both students and staff needed time outdoors during recesses, and one mentioned that the outdoor experiences at school were different than outdoor experiences with families due to peer involvement. Many participants mentioned differences in behaviour outdoors for students with exceptionalities, especially social needs, as there is a wider range of options for play, while one participant discussed how outdoor experiences allowed some students to show different strengths. One participant suggested that Outward Bound was often more difficult but helpful for students with social needs, however one participant mentioned how there was no difference in behaviour outdoors for students with special needs. Several participants described how outdoor time was useful for students’ behaviour, however a few expressed increased difficulties with behaviours outside as students could be overexcited, and one participant mentioned that this was most apparent in boys. As one participant suggested, “they seem
to enjoy learning more when they are not stuck inside the classroom they feel free and usually have brighter and bigger smiles.”

4.1.2.2 Influence of Nature on Student Happiness & Wellbeing

Several participants described how it was necessary to get students outdoors as many spent a lot of time indoors, and one mentioned the tendency to remain stuck inside the closed environment of the school. Several participants discussed students’ enjoyment of being outdoors, though one mentioned how there were a few students over the years that didn’t like being outside. Several participants mentioned how students loved going on field trips, while one mentioned senior students’ positive recollections of field trips in earlier grades, and another mentioned how Outward Bound helped develop peer relationships. As one participant described,

“the benefits outweigh everything I think the fresh air the exercise the learning the exploring the observing just teaching them about the world around them not stuck in the classroom… it’s a very closed in environment here at Montcrest so it’s nice for them to experience other parts of what goes on out there not just what’s in the classroom, ‘cause you can’t teach everything from a desk you have to take them out and let them see it and learn it and feel it and touch it do you’re using more of your senses than just sitting at a desk.”

4.1.2.3 Influence of Nature on Student Academics

Several participants described how nature promotes creative thinking and learning, as well as how it prompts them to ask inquiry questions. A few participants discussed how physical movement outside of the classroom helped learning, while one participant suggested that outdoor physical activity improved learning by boosting motivation and cognitive functioning, while another participant described how nature
engaged a sense of discovery which motivated learning in other academic areas. As one participant suggested,

“nature has a natural huge discovery factor to it and that sense of discovery is the motivational strive point of education right, if you get kids excited and they’re motivated and they wanna discover and explore and learn then that’s going to trickle over into everything that they do.”

4.1.2.4 Influence of Nature on Student Executive Functions

Several participants described how nature alleviated students’ stress which influenced their EF, and how giving students more chances to get outside has helped with their EF. Several participants mentioned how nature influenced students’ EF through their emotions, and one discussed how emotions were heightened in nature which provided opportunities for practice of EF. Several participants discussed differences in students’ EF during outdoor classes as compared with indoor classes, however a few participants mentioned that the use of EF didn’t change outdoors. Several participants discussed particular EF in relation to nature including how goal directed persistence and shifting were often advantages of NBL, how freedom outside gave students more room to develop emotional control but that this also allowed room for a lack of emotional inhibition, and how students were less prone to inhibit responses outdoors though there was less need to do so. As one participant described, “I think that, NBL would provide a lot of opportunities for that, for practice and use of those Executive Functions.”
4.1.3. Supports & Barriers to the Integration of Nature

4.1.3.1 Physical Supports for Integrating Nature

Most participants mentioned a variety of facilities that helped to integrate nature including the courtyard and community garden in school, as well as Riverdale Park with its tennis courts, an outdoor arena, soccer fields, and forests. Several participants mentioned how the courtyard allowed students time outdoors in between classes, while one participant mentioned a nearby local public allotment garden, and another mentioned how the urban school had many nearby outdoor spaces to use. A few participants mentioned how recent developments have helped the school integrate nature through remodeling the backyard, while some mentioned how the physical supports provided opportunities for future programming outdoors, and one discussed funding that was provided for learning spaces such as the community garden. As one participant suggested, “unique to our school too is, we are surrounded we’re the downtown school we have a location that allows us to, escape the city.”

4.1.3.2 External Organizational Supports for Integrating Nature

Several participants discussed how field trips involving NBL were useful to teachers in gaining access to experts for outdoor activities and relieving the need for planning, while one mentioned how these trips provided breaks during the year as well as helped them develop a better relationship with students. Participants discussed organizations used by the school including Outward Bound, Tree Canada, the TD Shoreline Cleanup, Crawford lake, Cedar Glen, the Norval outdoor centre, the Kortright centre, Edwards Gardens, Riverdale Farm, Black Creek Pioneer Village, the YMCA, the Science centre, and the Toronto Zoo. Several participants mentioned resources available
to teachers including faculties of education, and one participant mentioned how professional development courses had been useful for learning strategies to teach outdoors. As one participant described, “[teachers] see field trips as the opportunity to go to a place where you have people who are experts in those facilities who can know how to manage the kids, and have the resources for orienteering, I think we do a lot of that.”

4.1.3.3 Teaching and Programming Supports for Integrating Nature

Several participants discussed how flexibility with lesson parameters helped through being able to change expectations, materials, lesson delivery, and the level of freedom given to students. Most participants described teacher strategies including advanced planning, communication to find support, preparing students, bringing a first aid kit, informing school and parent groups, modeling, being mindful of student to staff ratios, bringing nature inside, understanding pedagogical differences in teaching outdoors, and having attention grabbers. Several participants discussed how understanding the benefits of getting students outdoors was helpful, and how nature helped instill a desire for exploration in students, which was especially useful for science classes. A few participants discussed how NBL helped meet students’ different learning styles, and how outdoor lessons afforded better opportunities for group work. Several participants mentioned being able to rely on support from other staff, while a few participants suggested a need for support in planning and orchestrating outdoor lessons. Several participants mentioned educational resources including stories, readers, clipboards, collections bags, gloves, textbooks, and internet resources. One participant suggested the need for a wider variety of games for physical education, and another discussed clubs and activities as opportunities to get students outdoors. As one participant
described, “I think there’s lots of support if we ever want to take our students outside… I feel supported in the opportunity if I wanted to do something I know there would be support there.”

4.1.3.4 Internal Organizational Supports for Integrating Nature

Participants suggested that the administration in the school was highly supportive of efforts to integrate nature, while one mentioned how the administration would be more supportive of more structured outdoor education experiences. Several participants mentioned particular staff members who were helpful in setting an example, while a few mentioned how the principals’ views on outdoor education had a large impact. Several participants suggested that parents were supportive of field trips involving NBL like Outward Bound, how they never had trouble finding parents to come along on these trips, and how there was support from parents for the use of park facilities. Several participants discussed how the school schedule allowed students time outdoors through the morning, lunch, and afternoon recesses, the directive to get students outside as much as possible at recess, and the regular outdoor gym classes. Several participants also discussed extra-curricular activities and events that bring students outdoors including the house system with outdoor games, Kite Day, the Mini Marathon, the Terry Fox run, and the Eco Club. As one participant described,

“any time you mention you’re going outside or you talk about the facilities that we have here and oh isn’t it so great that you guys have a park down there you can go down for recess you can play all those crazy games it’s just like you always hear that.”
4.1.3.5 Teaching Restrictions and Barriers to Integrating Nature

Several participants suggested that outdoor classroom management was difficult for teachers due to distractions and sounds, a lack of understanding on how to teach outdoors, and a worry about losing control of the class. Many mentioned safety concerns including dressing appropriately for the weather especially in older grades, while one discussed planning for potential safety issues as a concern, and another mentioned preparing for dangerous objects in the park as necessary for activities involving garbage cleanups. Some participants discussed how time impacted teachers’ ability to conduct classes outside, especially in winter, due in part to issues with transportation. Many participants mentioned how curricular priorities impacted their ability to take classes outside, as well as how their curriculum was often built on software applications for use in smart boards. Several participants discussed barriers preventing parents from supporting outdoor learning experiences including a lack of support for unstructured free play outdoors, a desire to assume that their children’s learning should be like their own, and the need for specific connections to how NBL would help their child’s education. Some participants mentioned barriers to NBL experiences in the park including transportation with the need for washrooms and occasional mobility issues for specific students, though there were strategies to navigate such issues. One participant also discussed restrictions to doing gardening work in the school due to problems in growing vegetables over the summer. As one participant described,

“there’s a lot of flack you can take from parents over that a lot of parents would say, why are you spending forty five minutes playing in a park when my kid could be getting better at his hockey skills he could be getting better at this he could be on a select team.”
4.1.4. Process of Integrating Nature in Curriculum and Programming

4.1.4.1 Process of Integrating Nature Across Time

Several participants discussed how the administration and parents have helped by putting the strategic plan in place, developing the backyard environment and the community garden, as well as supporting research on NBL. Several participants mentioned how teachers needed time to build NBL into their curriculum in order make such experiences meaningful, while one suggested that they were working towards going outside for classes, and another discussed how they enjoyed watching the initiatives involving NBL develop in the school. Several participants mentioned how NBL has been integrated over time with Outward Bound and in using the community garden for lessons. One participant described how supervision of students in Riverdale park at recess has changed over time due to staff and student input, while another suggested that the development of routines for taking students to the park had changed over time. A few participants mentioned how scheduling changes have allowed for NBL over time such as the use of outdoor gym classes and in changing the class schedule to accommodate an extra recess in the afternoon. As one participant suggested,

“the Brickworks is a huge resource for us and the students, I think that they’re getting to a place where they love it I think it’s been a battle for some of them I think the first few experiences at the Brickworks weren’t always positive I think they went there and were doing the same thing over and over a few times.”

4.1.4.2 Process of Integrating Nature Across Divisions and Grades

A few participants mentioned how the junior kindergarten program has been helpful for integrating nature in the school, but that this program may be changing as there’s a new teacher. Several participants noted how the senior division set a good
example of how to integrate nature, while one discussed how the principal was trying to integrate nature across divisions by using the senior division as a model. Several participants mentioned work being done to integrate nature across all divisions, though one suggested that improvements could be made especially across grades one to five. As one participant suggested,

“the senior division looking at what they do and then now [the head of school] is trying to get it to trickle down to the junior division and hopefully eventually to the primary division, maybe we look at doing some, Outward Bound stuff not on the same scale, but you know a little bit more working towards that.”

4.1.4.3 Potential Ideas to Improve Process of Integrating Nature

A few participants noted that time to focus on co-planning outdoor ideas would help, and one discussed how co-planning between grades regarding planting in the spring and harvesting in the fall would be useful. A few participants mentioned how there had been past discussions on renovations including a greenhouse as well as outdoor classrooms in the valley behind the school, and one participant also suggested developing a larger variety of outdoor games and using the park facilities more. As one participant suggested,

“it would be interesting to be provided time or not even taking away from teaching time but to have PD focus on, time for figuring and working in teams to find ways to integrate nature-based learning into our programming so it’s doesn’t feel like an add on and it feels more like it’s part of what we do.”
4.1.5. Applicability of Nature to Teaching and Curriculum

4.1.5.1 Current Examples of Teaching and Curriculum Involving NBL

Many participants mentioned how the senior science teachers employed a variety of lessons including using paper airplanes outdoors to study flight, building environmentally friendly stain removers, planting trees in the community garden, classifying trees, connecting Outward Bound and the TD Shoreline Cleanup experiences, and analyzing biodiversity in square plots. Several participants also described lessons in the primary and junior grades including growing vegetables, comparing soil samples, showcasing natural disasters, studying habitats, creating spaces for butterflies, and looking at geology outdoors. Several participants also discussed lessons from other primary and junior curricula including math through teaching number lines outdoors, social studies through orienteering and mapping, as well as languages through doing writing tasks outside. A few participants discussed lessons involving movement including stopping classes for exercise when needed, as well as going outdoors during physical education classes for sports, outdoor games, and free play. A few participants also mentioned the perception that there was already a high level of NBL in the school, and how everyone does a small amount of NBL school-wide. One participant mentioned how they perceived the senior science teachers to do a lot outdoors, and another spoke about how outdoor weather conditions allowed teachers to connect inquiry questions easily. As one participant suggested,

“yesterday the snow was falling… the kids were excited about the snow being there so let’s incorporate that enthusiasm for snow and it may not be directly linked but there’s always that chance to shake things up and connect something small you’ve spoken about or ask an inquiry question.”
4.1.5.2 Applicability of Nature to Teaching and Curriculum by Grade/Age

Several participants mentioned how the primary grades employed a fair degree of NBL, while a few discussed the kindergarten programs’ use of the outdoors in previous years, and one mentioned how as long as reading and mathematics curriculum expectations were met parents loved their kids to be outdoors. Several participants discussed how junior and senior grades employed various outdoor education initiatives, and how one of the junior division teachers actively tries to incorporate NBL. A few participants mentioned how NBL was a large part of science in senior grades, and one suggested that the natural world was a good basis for comparison of human social structures in senior grades. A few participants mentioned how they felt NBL was important across all grades, and how outdoor spaces presented opportunities for leadership between grades. As one participant described,

“in JK with [a past teacher]… all they did was go outside so they did an outdoor education experience pretty much every day whether it was in the snow [the teacher] was teaching them how to build fires they went fishing it was amazing for that class.”

4.1.5.3 Applicability of Nature to Teaching and Curriculum by Subject

Several participants mentioned how there were many opportunities to connect students to nature through particular units in science, and a few discussed how certain science units incorporated NBL more easily. One participant suggested that while the location and degree varied there are many ways to involve NBL in science, and another mentioned how NBL was useful in science for developing observational skills. Several participants discussed the applicability of NBL to language studies suggesting that although such lessons were possible there were curricular demands and outdoor
distractions that made it difficult, though one suggested that language was a tool that could be used in many environments easily. A few participants discussed opportunities for NBL in social studies, several of which were easily connected to science, while a few mentioned how math lessons were possible outdoors. A few participants discussed the applicability of NBL to physical education classes, while a few suggested that NBL could be applied to curriculum in general across a variety of subjects and units, and one described how parents were supportive of outdoor classes to an extent as long as existing technology was being used effectively. As one participant described, “I think every subject can use the outdoors as a place to learn you can incorporate math, science, geography, gym, art, whatever, and it doesn’t mean you always have to but you can certainly go outside.”

4.1.6. Researcher’s Baseline Phase Observational Notes on Current Level of Integration, Supports, and Barriers

From the perspective of the researcher there are many existing initiatives involving NBL within the school already. Students regularly go outside to the school courtyard for two 15-minute recesses daily, as well as a 40 minute lunch recess where young students play in the courtyard and older students go to the park adjacent to the school. There are a number of school-wide events that use the courtyard and park including the Terry Fox run, the Montcrest Mini-Marathon, the TD Great Canadian Shoreline Cleanup, and house activities. Students in grades six to eight participate in Outward Bound several times during the year, and several younger grades participate in field trips involving NBL. Many extra-curricular initiatives use the outdoors, including athletics tryouts, practices, and games in the park, eco club meetings in the garden, and
garden drop-ins (bringing primary students and senior leaders to the garden for caretaking at lunch recess). A small number also bike and walk to school, although substantially less in harsher weather.

There are several examples of efficient programming involving NBL, the best of which are regularly scheduled outdoor gym classes, the grade six science classes going outside in the park, courtyard, and garden with their biodiversity unit, the kindergarten classes going outside to start their day, and one grade four class getting outdoors for math as well as trips to the Evergreen Brickworks. There are several examples of resource sharing between staff announcements about conferences and current practices, co-planning meetings regarding outdoor/environmental education, as well as sharing at division meetings.

While there are examples of effective programming outdoors there are also poor examples such as taking students outdoors without any attempt to integrate curricular topics, examples where school politics skew the effect of opportunities for NBL, and a large majority of classes that don’t use the outdoors at all during class time.

There are curricular demands that have a large impact on teachers’ motivations and freedom to get classes outside, as well as restrictions in terms of time and supervision. Teachers are relatively unsure of exactly what outdoor classes look like, so there is a strong need for professional development involving NBL as well as an increased need for time specifically for allowing teaching partners to develop lessons integrating NBL. Finally while there are facilities, equipment, and supervisory supports that allow for outdoor programming, some staff believe that there could be further development of such resources.
There is clear support from the administration as well as teachers, parents, and the teacher/researcher to get students outside. There have been several opportunities for the sharing of ideas in staff meetings, as well as learning from Outward Bound staff and sharing of NBL resources between teachers. There are many successful and effective outdoor-based field trips already in place across grades, as well as current NBL initiatives going on in the school. There are many teachers that understand the value of bringing students outdoors, as well as an understanding that the school is in a good position to be doing this type of work.
Table 2: Meta-themes and Themes for the Implementation Phase

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**4.2.1. Teacher-based Supports for Nature**

**4.2.1.1 Personal Connection to Nature**

Several participants described how they felt connected to nature, enjoying being outside in the wilderness, going for walks, as well as doing landscaping and gardening work. A few participants mentioned their families’ connection to nature through learning from parents outside during childhood, spending time with partners in nature, as well as being active outdoors with current families. One participant mentioned how their current family was often pushed outdoors by their own child, while another mentioned a considerable degree of experience with growing various species of plants. As one participant suggested, “I really have a strong personal connection to nature always have, and just totally value it and have always.”
4.2.1.2 Planning for Next Year

Several participants described planning for more opportunities involving NBL with teaching partners for the 2015/16 year, while a few mentioned extending the length of time committed to units involving NBL, and one was planning on going more in depth for a particular environmental unit. A few participants mentioned working with teaching partners to shift the timing of particular units in order to align better with the seasons, allowing for more curricular use of outdoor spaces. One participant mentioned how they had incorporated new outdoor field trips, and another discussed how their field trip had changed to an option that incorporated a higher degree of NBL, as well as shifting programming within that trip to accommodate more opportunities for NBL. One participant suggested that they wanted to focus more on the environment as a big idea in science, and another participant mentioned another staff member testing a new environmentally focused language unit next year. As one participant suggested,

“my partner and I initiated that we should plan our units a little bit differently and shift our time so that we can actually spend more time on our one specific ministry-based unit so we’re both increasing the amount of time we’re giving it and also increasing the amount of use of the Montcrest locale and the Montcrest garden for it”

4.2.1.3 Change in Professional Approach to Nature

Several participants discussed an increased awareness of the value of nature as being a large personal change over the year, as well as mentioning their desire to augment future curriculum and programming in order to allow for more NBL. These participants suggested that they were more motivated to move classes outdoors, trying harder to incorporate NBL into programming, and that this was occurring across many different subjects. A few participants suggested becoming more comfortable bringing classes
outside, which got easier each time, while one mentioned how their comfort went up, that they felt safe taking the students to the garden, and how they perceived there to be fewer challenges in taking students outdoors for class. Several participants discussed an interest in being part of the changes happening in the school regarding NBL, and one mentioned looking forward to changes in recess as well as to observing its impact on student behaviour. One participant mentioned how they had never used the garden in the past but had gone around five times during the year for classes, how they now spent the entire period outside instead of heading back inside after objectives were accomplished, and how their follow-up to outdoor lessons was improving. Another participant discussed how learning from Outward Bound and professional development experiences was useful for teaching students outdoors as well as recognizing students’ different skills outdoors. Participants rated their comfort level and confidence level in taking classes outdoors as relatively high. As one participant suggested, “I don’t think there’s as many challenges as I thought there were… I think a lot of it is perceived challenges but then when you get out there it’s, actually very good learning.”

4.2.1.4 Examples of Lessons involving Nature

Participants shared examples of lessons they had seen or conducted that involved NBL across divisions. Examples of primary division lessons included comparing plant and animal needs, planting potatoes, and dissecting plants in the classroom. Examples of junior division lessons included planting pollinating flowers and vegetables, identifying habitats, talking about biodiversity in the community garden, as well as discussing the importance of protecting the environment for future generations. Examples of senior division lessons included mostly iSTEAM projects such as looking at biodiversity
alongside urban diversity, looking at waterways, ecosystems and litter by creating infographics, and researching world water issues alongside developing a water filter. As one participant suggested,

“after we got back from [our field trip] I sat them down and we talked about how important they are because we’ve all screwed up the world, and I said it in the nicest way but I said you know, the generation before us and our generation is not doing a great job it’s starting to shift but you guys have a big job to get it back together so that you don’t end up with some horrible planet by the time you’re our age”

4.2.1.5 Teacher Strategies to Integrate Nature

Several participants mentioned the value of having time to co-plan and research ideas for NBL, especially when working alongside enthusiastic teaching partners. A few participants discussed the value of having other teachers for classroom management and safety, as well as to learn from in guiding species identification and modeling teaching strategies in order to be more comfortable leading outdoor lessons. One participant suggested that creativity was important, along with finding good fits for outdoor activities, having a variety of teaching approaches, and recognizing the potential of language as a vehicle for exploring the world. Another participant suggested the value in trying new things and learning from what works, recognizing that it’s ok if things don’t go as planned and building from initial experiences. Several participants suggested strategies including frontloading instructions and making a list of activities to be completed indoors, being clear about behavioural expectations, reminding students that it isn’t recess, allowing flexibility for the completion of tasks outside for older students, as well as focusing students on different senses in order to make scientific observations. Several participants suggested that being outdoors was valuable in allowing for students to get their energy out, particularly for very active students and boys, while one suggested
that providing students an opportunity to be excited and active then settling them down for a lesson was an effective strategy. One participant suggested that being outdoors allowed for some students to tie in personal experiences to class concepts in new ways, while another mentioned that a variety in teaching methods was important. A few participants also discussed resources including indoor habitats, venues for students to bring in questions about the world, internet resources, and environmentally-oriented curricular aides. As one participant suggested,

“I think it’s ok to understand that it’s great if you try new things and then if something doesn’t go exactly the way you want just realize that you don’t get anywhere if you don’t try… if it’s not exactly the way you want it, it can push you in a new direction or slant or space differently too… sometimes the first time you try something it’s messy and that’s ok just allow it to be messy and you can gain so much from that to tweak or improve”

4.2.1.6 Executive Functions during Outdoor Lessons

A few participants mentioned how students’ EF were improved outdoors, as students have space as well as adults parameters and expectations changing. Several participants mentioned how students’ EF needed to be practiced in all environments, and how a variety of learning activities were helpful for students’ EF so the learning isn’t too monotonous. One participant mentioned how EF were better when students were given tasks without downtime, as they fell apart quickly with loose time as it feels like recess. A few participants mentioned benefits to specific EF when outdoors including more goal-directed persistence as students are more energized, quick shifts in focus for activities that had strong consequences if not completed in time, easier task initiation, and how students were often distracted by computers indoors, suggesting that outdoor lessons allowed for more focus. As one participant suggested, “I think overall their Executive
Functionings are really improved when they get to be outside and get to move around and have space, that’s the biggest things about being outside is the space.”

4.2.2. Community-Based Supports for Nature

4.2.2.1 Support from Staff in School

Several participants mentioned how the senior division teachers were inclusive and collaborative especially in regards to iSTEAM projects, as well as how this workplace mentality extended throughout the school. Several participants discussed the role of the teacher/researcher in bringing awareness for NBL to staff, supporting curricular ideas involving NBL, supporting outdoor classes, helping with Eco Club and garden drop-ins, as well as providing current resources. A few participants suggested that working with teaching partners was useful to co-plan outdoor lessons, solve problems to improve future lessons, draw upon different areas of expertise, share resources, and bringing in various organizations. A few participants discussed the value of the librarian in providing resources with outdoor and environmental themes, as well as how there were teachers who were helpful for identifying various plant species, helping with environmental educational ideas, as well as having enthusiasm for gardening, cooking, and growing food. One participant discussed how it was always helpful having another teacher along for outdoor classes, as well as that having such support enabled successful lessons through team teaching and co-planning. Participants mentioned strong support from administration for NBL, and one discussed how this was due to their recognition of it being purposefully connected to curriculum. Several participants mentioned the principals’ strong interest in NBL due to his valuation of nature along with his love of canoeing. Participants suggested that support from the board of governors was likely
high, and one mentioned how this could be seen directly through their hiring of the current principal as well as their support for the naturalized schoolyard, the garden, and collaboration with Outward Bound. Several participants discussed how there are few barriers for outdoor ideas, and one mentioned how people were highly supportive of each other in the workplace. One participant suggested that the new director of curriculum was supportive of NBL, and another mentioned how the school was supportive in general of NBL at many levels. A few participants mentioned a heightened awareness to use the outdoor spaces and collaborate with other teachers, as well as that staff were actively looking for more opportunities to go outside with students. A few participants suggested that the senior division was a model for others to follow in terms of their integration of NBL into curriculum, as well as how bringing in new people helps to change perspective, such as in the big change with Eco Club over the year having two new staff members involved. One participant suggested that having staff members bring ideas from conferences was helpful, and another suggested that asking family members was useful for gathering ideas. As one participant suggested, “there’s a bit more awareness in general that we can use these outdoor spaces especially when we’re collaborating.”

4.2.2.2 Programming Support in School

Participants discussed field trips and external organizations as being important supports for NBL, while a few mentioned Outward Bound as helpful for not only for students but also for teachers in providing leadership examples. Several participants discussed the Eco Club being more visible than in other years through school assemblies, Eco Club students’ excitement coming back to class, the Ontario Ecoschools certification, and in supporting garden initiatives. A few participants mentioned the
garden drop-ins as being exciting for students in allowing them to take on management of outdoor planting, as well as selling vegetables at the Fall Fair and donating proceeds to Foodshare. One participant mentioned the creation of outdoor captains (grade 8 students) who are intended to help support outdoor initiatives and lead students to manage the garden. Several participants mentioned the senior division iSTEAM initiative and how it aligned well with NBL due to being cross-curricular, divisionally supported, allowing for team-teaching, and lending to having more staff bodies in the ratio for outdoor lessons. A few participants mentioned the value of professional development opportunities for outdoor teaching strategies, while one participant suggested finding particular curricula to support the integration of NBL. One participant mentioned how they felt that the school was going in a good direction through a state of ‘good chaos,’ while another suggested that there was more use of outdoor spaces in extra-curricular activities. One participant mentioned the idea of an online schedule for booking the teacher/researchers’ time for outdoor lessons, while another participant suggested the need for time to co-plan lessons involving NBL with other teachers. One participant mentioned how each outdoor class supported each other outdoor class, as students get used to expectations and become more comfortable during outdoor lessons. As one participant mentioned,

“I feel like because of iSTEAM and the cross curricular nature we’re able to help each other out or group our schedule to team it outside, so I think that model works well if you’re sharing something or you’re supporting someone as if it’s divisionally supported it helps ‘cause you have more staff bodies in the ratio.”

4.2.2.3 Students’ Connection to Nature

Participants mentioned how students love being outdoors, while a few suggested that they were motivated by being outdoors and that they enjoyed the variety of outdoor
options offered. Several participants suggested that it was important to let students outside to burn off energy especially for active classes, and that students got excited by being outdoors, though this was sometimes hard to manage. One participant mentioned their interest in seeing the change in next years’ schedule and that it would likely be great for students. A few participants mentioned how students were often highly engaged outdoors, that there were clear benefits to outdoor lessons, and that the learning was different outdoors than inside a classroom. One participant suggested that having variety in lessons including both NBL and technology was important for motivating students, as well as that students were constantly asking whether they could do their learning outside as they understood the concept and loved it. Several participants mentioned field trips involving NBL and how they were often successful, students enjoyed them, and they offered an opportunity to see students interacting and adding different skills during outdoor group activities. Several participants discussed students’ motivation for environmental science, their engagement in completing iSTEAM projects, and their enjoyment of outdoor library periods involving reading. A few participants mentioned students’ drive during lessons involving creating habitats for wildlife, their lack of off-task behaviour, how everyone was interested, as well as the insightful conversations with topics related to dissecting, planting, and monitoring of various plant species. A few participants also described iSTEAM lessons and how students were motivated to complete these projects in all classes where a component took place. One participant discussed students’ involvement in Eco Club and garden visits, and how students who took part in these groups were particularly engaged in outdoor lessons. As one participant suggested, “[the planting lesson] was really good they were all engaged they were all interested they all wanted to do something nobody was messing around.”
4.2.2.4 Family Involvement with Nature

Several participants mentioned how parents were supportive of NBL seen mostly through how they were happy to come on field trips, hearing positive feedback about such excursions, and the lack of any negative comments about NBL initiatives. One participant suggested that parents might not understand the importance of students’ being outdoors, and mentioned how in the past there was strong awareness from parents about the junior kindergarten class being outdoors but now with a new teacher it wasn’t as clear. A few participants suggested that parents have been supportive of selling trees at the Fall Fair, that they were impressed with iSTEAM work, as well as that they were excited about the schools’ growth and change towards new initiatives. One participant suggested that there was excitement being generated from home for class projects involving NBL, and that there were some examples of students being able to bring plants home for family gardens. A few participants also offered ideas for bringing parents to the garden including allowing them to participate in the harvesting of vegetables, encouraging watering and ownership of the garden over the summer, as well as facilitating activities in the garden during family events. As one participant suggested, “I’ve never had anyone say anything negative so for me I’d say parents are very supportive, I’ve never had someone complain about something done outside.”

4.2.2.5 Facility Supports to Integrating Nature

Several participants mentioned how there had been more use than ever before of the garden in the past year mainly through garden drop-ins, planting vegetables and flowers, as well as using the space for several classes such as library and science periods.
A few participants mentioned how the courtyard enabled easy outdoor classes including reading, having more space for activities, and filming for drama as it seems quieter for such lessons than in the classroom. One participant mentioned how the best part of using the outdoors was the space as it lent to better EF, while another suggested that the front planters would be good for getting families involved in gardening projects, and that looking at visible garden exemplars from other schools might offer some good ideas. As one participant suggested,

“P: more people are using the garden I was amazed at how many people had planters, if you looked I think it was two three four… six is the trees pretty much every grade…
I: Ya [also] 6SL with [another teacher] for one drama class… and 7V… half the school anyway or sixty percent or something like that
P: And that’s a big that was that did not happen in the last few years we barely went”

4.2.3. Barriers to Integrating Nature

4.2.3.1 Student Issues with Being Outdoors

Several participants suggested that outdoor classroom management sometimes became more difficult as students are excited but can be harder to manage, it is easier for students to sneak off and do their own thing, as well as EFs can fall apart more easily. A few participants mentioned how there were occasionally students that didn’t like the outdoors but that this was rare, and one suggested such students might be uncomfortable at recess or during outdoor gym periods. One participant suggested that as the school accepts many different types of students it was important to remember that outdoor learning isn’t for everyone, and that it was valuable to find aspects of NBL that were helpful for solutions in accommodating such students. One participant also suggested that students’ interest in the garden may change from the earlier grades to the later grades as
outdoor classes at the school were new but may get old quickly. As one participant suggested, “I find it’s still a bit of a classroom management challenge… to go outside with them mostly because it’s hard like I really want them [working] and it’s easy for them to sneak away and do their own thing.”

4.2.3.2 Curriculum and Time Restrictions

Several participants mentioned curricular expectations often being a challenge and that meeting these expectations was often easier inside as taking kids outside included an extra transition, making time a significant barrier in preventing classes from going outdoors. A few participants discussed the many changes to staff, the IEP process, and curriculum over the year which kept the workplace busy. One participant suggested that it was often challenging to connect parts of their curriculum to NBL, as well as that going outdoors didn’t fit well with their curriculum and grade level. One participant suggested that the timing of particular units didn’t correspond well with the seasons, as well as how they tried not to use ideas that crossed into curriculum from other grades. Another participant suggested that some parents don’t care much about NBL as they just wanted kids to focus on literacy and numeracy, as well as how costs involved with particular projects was always an issue. As one participant suggested, “the challenge is just a time challenge… sometimes there seems to be so many expectations it just appears to be easier to get them done in the classroom, to take kids outside it’s just that little bit extra of transitioning.”
4.2.3.3 Facility Barriers to Integrating Nature

Several participants suggested that there were limitations to gardening in the school, as the soil wasn’t deep in the planters at the front of the school restricting growing options, as well as that families didn’t see the community garden as it’s disconnected from the main school. A few participants mentioned how there were limitations to gardening in terms of needing to plant vegetables that were able to be harvested in the Fall when students were back, as well as how it was difficult to connect gardening with cooking as there’s no available kitchen. A few participants mentioned how the school could use Riverdale park more as the space is very limited on campus, how there wasn’t much outdoor space in the urban school as compared to schools outside the city, and how there was no outdoor education centre tied to the school as is the case with some other schools. One participant discussed how it was important to think about physical limitations in rougher outdoor areas, and another suggested that the ratio of students to teachers was different in outdoor spaces when going beyond the school boundaries. One participant suggested that it often got too cold when the air conditioning was on which made it difficult for some species to survive indoors, but also mentioned how they felt that there weren’t any significant barriers in terms of location. As one participant suggested, “we have to use Riverdale a little bit more, we have to go off to Brickworks or wherever we need to go, we can’t just use our space.”

4.2.3.4 Comfort and Skill in Teaching Outdoors

Several participants mentioned barriers relating to teachers’ comfort level regarding teaching outside including being comfortable helping to facilitate challenges from Outward Bound but not comfortable leading them, as well as not enjoying the cold
weather in the winter. One participant also suggested that they weren’t comfortable identifying plant species in the garden, as they weren’t comfortable with their own level of outdoor knowledge due to not learning about such things in their own education. A few participants discussed teachers’ lack of outdoor skills including not knowing how to implement NBL, and suggested that it was often difficult for some staff to change their teaching style. One participant suggested that there were less challenges to teaching outdoors than perceived during the baseline phase of the study, while another mentioned how they didn’t feel there were significant barriers personally but that there may be some for others. As one participant suggested, “when you go to Plant World I know what most of the stuff is but stuff that grows naturally I’m not very good with.”

4.2.4 Researcher’s Implementation Phase Observational Notes on Current Level of Integration, Supports, and Barriers

From the perspective of the researcher there are many opportunities for NBL existing within the school curriculum and programming already, and there have been some changes over the year. There were a number of school-wide events during the implementation phase that used the courtyard and park including Earth Day activities, the schools’ observance of Earth Hour, the annual Kite Day, and house activities. There were a number of initiatives aided by the researcher during the implementation phase including an online staff survey, receiving a gold Ecoschools certification, arranging for student artwork to be published in *Pathways: the Ontario Journal of Outdoor Education*, and the creation of the ‘outdoor captains.’

While there was no change in the daily schedule during the 2014/15 year, there is a projected change for the 2015/16 year that will change the length of recess from 2
fifteen-minute recesses and 1 forty-minute lunch break to 3 thirty-minute recesses daily. This will allow the junior and senior students (grades 4-8) to go down to the park 3 times daily instead of only once, which also frees up the school courtyard for the younger students. The school hopes to make better use of the space for recess with the change, as well as be able to open up more options and times for extra-curricular activities.

In terms of NBL during classes, there has been some enthusiasm from several teachers to get students outside in class time, including outdoor drama, French, library, science, and art. The most effective changes to teacher’s integration of nature in their curriculums were in outdoor French classes, where acting-based French scripts were rehearsed better outside than inside, as students had room to spread out, be expressive, and were free of close distraction from others. Many of the teachers have started to think more about students’ connection to nature, and are planning on re-working their curriculum for the 2015/16 year to accommodate more opportunities for NBL.

While it is clear that the head of school sees integrating NBL within the school as a priority, and that there are a number of staff that are also supportive, there are also competing interests that give the impression that NBL is a minor priority as compared with other initiatives. There were some instances of other teachers discussing an interest in using the teacher/researcher to work on lessons involving NBL, but then not following through with their original intent. There were also some examples where political struggles in the workplace diminished the capacity for the school to be working effectively on environmental projects.
Chapter 5: DISCUSSION

The purpose of this study was to document current outdoor and environmental education initiatives taking place at Montcrest school, develop an action plan to implement further integration of such curriculum, and to gather staff perspectives on the implementation phase of the project. The study sought to identify existing barriers and supports to this integration, as well as gain solutions through both the participants’ suggestions and the research process. The research questions were 1) What are some of the elements that foster the integration of NBL within the school curriculum and programming from staff perspectives? 2) What are some of the barriers to integrating NBL within the school curriculum and programming from staff perspectives? 3) What are some of the supports for integrating NBL within the school curriculum and programming from staff perspectives? The following section will explore the meta-themes and themes from both the baseline phase and the implementation phase alongside the researchers’ observational notes to answer the research questions.

5.1 What are some of the current elements that foster the incorporation of NBL within the school curriculum and programming from staff perspectives?

The findings suggest that staff are inclined to value their connection to nature and be receptive to understanding the cognitive, emotional, and social benefits of contact with nature. Results also suggest that there is room to grow in terms of outdoor pedagogical skills. Providing opportunities for collaboration amongst staff, a support identified by several participants, may be an effective tactic in order for those with more confidence and comfort in teaching outdoors to share strategies, stories, and opportunities.
There are many nearby outdoor spaces used often, though there is potential to be using these spaces to a greater degree, and there are other opportunities for NBL existing within the curriculum and programming provided by the school. Many external partnerships have already been established with outdoor organizations such as Outward Bound, and there are some examples of teachers who find time and collaborate with others to enable integrated outdoor lessons, however a large majority of classes take place indoors especially during the winter.

A report on Environmental Education (EE) and sustainability in American independent schools (Inverness Associates, 2013) showed that interest in EE was highest among heads (71%), students (66%), and faculty (62%), and less so among staff (47%), parents (43%), and board members (39%). A similar trend can be found at Montcrest School as there is strong interest from the principal, most students, and many faculty, though interest from staff, parents, and board members is less clear. The report suggests that EE initiatives were led by a ‘sustainability coordinator’ working with a small group of staff and parents in 27% of schools (Inverness Associates, 2013), a model for which the role of the teacher/researcher could be geared towards to increase its effectiveness. There is a degree of flexibility to support research within independent schools due to their governance structure, providing a potential opportunity for researchers investigating best practices in education.

The same report showed that most schools surveyed had a garden (83%), while many integrated the use of the garden into curricular initiatives (59%) (Inverness Associates, 2013). The present school is similar as the garden space is used only sparsely, mostly for science classes and extra-curricular activities, and there are more opportunities for increased use of the space. Blair (2009) suggests that “the style of learning that
happens in school gardens, using direct contact with natural phenomena, is considered experiential, inquiry-based learning grounded in concrete experience” [55,56,57,58], and Kellert (2002) indicates that gardens involve “a rich diet for cognitive development… strengthening the cognitive muscle we call mind, and developing and reinforcing the child’s capacities for empirical observation, analytical examination, and evidentiary demonstration.” A systematic review of school gardens suggests that gardens improved science and more general test measures, students were motivated, took pride in gardening, and involved parents who often became more engaged with the school. Gardens promoted community through teamwork, student bonding, a range of interactions with adults, and outreach, as well as providing diverse opportunities for learning environmental stewardship, math, and science (Blair, 2009). A study of over 300 elementary schools showed that less than 5% of participants found gardening unsuccessful at enhancing student learning, and that 61% felt it was very successful. The most frequent use of school gardens was for science (92%), followed by environmental education (83%), mathematics (69%), language arts (68%), health and nutrition (59%), ethics (58%), and social studies and history (51%). Student ownership and integration with other subjects were seen to be factors most important to the success of the gardening program (DeMarco, Reif, & McDaniel, 1999).

The report on American independent schools suggests that in most schools EE takes place outside the classroom, in outdoor education (79%), service learning projects (73%), civic engagement projects (65%), and in environmental clubs (58%), though many are trying to integrate EE in STEM classes (72%), and some are attempting to integrate EE across the curriculum (51%) (Inverness Associates, 2013). The present school follows a similar trend, with many of the best opportunities for NBL found in field
trips, garden visits, and in iSTEAM classes. The report suggests that the most successful examples of integrating EE happen in lower school, followed by middle school and upper school (Inverness Associates, 2013), though the present school follows a different trend as the strongest examples come from iSTEAM classes in the senior division, followed by the primary and junior divisions. Only a few schools had a strong commitment to professional development in EE (15%), though the most successful schools were shown to provide a substantial amount of professional development experiences for faculty (Inverness Associates, 2013). Though there has been only a small commitment to professional development for the faculty to date, the report by Inverness Associates (2013), research by Dyment (2005), and results from the present study suggest that the successful integration of NBL in curriculum requires a commitment to faculty-wide professional development experiences.

5.2 What are some of the supports to integrating nature within the school curriculum and programming from staff perspectives?

Participants identified supports including staff who have a strong personal connection to nature, some who have professional backgrounds related to NBL, an awareness of students’ behavioural changes outdoors, many local outdoor spaces especially for an urban school, partnered organizations, teaching strategies, a model for collaborative lessons, a highly supportive administration, and logically-linked curriculum. This is similar to the results of a study that found characteristics of a school helping to increase the integration of NBL included support from teachers, parents, and the administration, freedom in the curriculum for exploration, collaboration among teachers, a research-based mentality, and an integrated curriculum (Schumacher et al,
The researchers found several resources particularly helpful in regards to integrating NBL including a naturalized school space, monetary resources, and equipment for teachers (Schumacher et al, 2012). Though the present school had an investment in naturalizing the current schools’ courtyard, there is limited equipment meant for teaching outdoors. The previous study found that teachers who were more likely to employ NBL were more aware of the benefits of contact with nature, more comfortable teaching outdoors, and believed in NBL (Schumacher et al, 2012). The present study was similar, in that teachers who felt more connected to nature personally were more apt to see the value in NBL and more likely to try taking classes outdoors. Researchers found that administration played a key role towards integrating NBL including recognizing teachers who were able to successfully integrate NBL, providing professional development, allowing teachers curricular freedom and opportunities for collaboration, supplying resources, and incentives (Schumacher et al, 2012). The present study found that while some of these administrative characteristics were met there are several means by which the administration could further influence the integration of NBL, namely providing professional development, outdoor teaching resources, a clear drive to make NBL a priority, and incentives for teachers including recognition in front of peers.

One of the largest supports to integrating NBL is the nearby Riverdale park, as well as the schools’ programming that takes advantage of its use for outdoor classes, extracurricular activities, and recess. The change in recess to occur in the 2015/16 year will support a greater degree of opportunities for unstructured free play, which is particularly important for child development. A survey of elementary schools in America showed that 7% to 13% had no recess at all, that the majority of schools only have one
recess a day (55% to 66%), and that the average number of minutes for daily recess was between 23.8 and 27.8 minutes (Parsad & Lewis, 2005). In contrast in the present school there are 3 recesses daily, and the number of recess minutes has gone from 75 minutes in the 2014/15 year to 90 minutes in the 2015/16 year.

A report on greening school grounds in the Toronto District School Board (TDSB) suggests that green school grounds enhanced student learning, renewed enthusiasm and opportunities to adopt innovative pedagogical practices, and allowed more positive social behaviours for students, as well as promoting environmental stewardship and awareness (Dyment, 2005). Recent research has also demonstrated that green school grounds promote a higher degree of physical activity (Bell & Dyment, 2006; Dyment & Bell, 2008; Haug, Torsheim, Sallis, & Samdal, 2010), that the design of such schoolgrounds makes a difference in terms of the intensity of children’s physical activity (Dyment, Bell, & Lucas, 2009), and that there is a wide degree of benefits to children’s health from physical activity in nature (McCurdy, Winterbottom, Mehta, & Roberts, 2010). The use of the local park at recess similarly allows students opportunities for outdoor physical activity and the range of benefits associated.

One identifiable support is the cross-curricular iSTEAM projects that allow for divisional exchanges of ideas, support, and freedom for curricular exploration, where projects are organized around a central theme, many of which are related to environmental education. The ability of the iSTEAM projects to invite opportunities for topics related to environmental education is in line with research suggesting that using the environment as an organizational centre for curricula raises test scores in math, literacy, and sciences, at least in part due to students’ motivation (Lieberman & Hoody, 1998; SEER, 2005).
Another useful support is the teacher/researcher for helping the classroom teachers with outdoor lessons and environmental ideas, as well as in bringing awareness to create opportunities for NBL. The position has helped in a similar way to a ‘sustainability coordinator’ in some American independent schools, allowing for increases in school approaches to sustainability. While three of four participants from the implementation phase found the role useful in directly aiding their attempts to integrate NBL in their teaching, one of the participants suggested that the researchers’ “influence more than maybe [their] actual specific assistance with units this year” had been useful for instigating change in their pedagogy and curriculum.

The focus on EF aligns well with the aims of further integrating NBL in the curriculum, as there are cognitive benefits to attention, mood, and anxiety (Selhub & Logan, 2012), and there may be different parameters of acceptable actions for students outdoors, due in part to the teachers’ expectations for behaviour changing. One teacher suggested that students were better with goal-directed persistence and sustaining attention during some outdoor lessons, and another suggested that EF in general were improved with outdoor lessons. A report on nature and EF suggests that children’s interactions with nature benefit their EF, and that unstructured free play in nature may be especially useful for developing EF during childhood and adolescence. The report defines EF as “an interrelated set of mental processes that allow people to retain and work with information, focus attention, filter out distractions, problem solve, and shift mental gears” (Child & Nature Network, 2015), suggesting that unstructured time, which often occurs when spending time in nature, may “uniquely support the development of self-directed control by affording children with additional practice in carrying out goal-directed actions using
internal cues and reminders” (Barker, Semenov, Michaelson, Provan, Snyder, & Munakata, 2014).

5.3 What are some of the barriers to integrating nature within the school curriculum and programming from staff perspectives?

There were many barriers that participants identified, most predominantly curriculum restrictions, time, and familiarity with outdoor pedagogy. These results are in line with a study finding that barriers to the integration of environmental education in a private school in Georgia included comfort, lack of time, lack of interest among teachers, politics, and safety concerns (Schumacher et al., 2015). Another study investigated the potential of school ground greening projects, finding challenges including fundraising, design and maintenance of school grounds, as well as teachers’ lack of understanding on how to deliver curriculum and manage student behaviour outdoors. The study suggested that teachers were not using the green school grounds as effectively as they could, suggesting the need for professional development, curriculum resources, and wider institutional support (Dyment, 2005). The results from the present study are similar, as though there are many local greenspaces used by the school, they could be used more effectively for lessons, and there is an identified need for professional development.

One barrier identified by participants in the present study was the need for professional development, as teachers were somewhat unsure of what outdoor lessons would look like. A document created by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) entitled Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability suggests that members of the international network repeatedly discussed the urgency to act quickly and the need for
profound change, and that those who participated were able to make significant
alterations. However, while Education for Sustainable Development (ESD) was shown to
be endorsed by enthusiastic teacher education institutions, it was suggested that it will
take a huge effort to establish ESD across all aspects of these institutions (UNESCO,
2005). The integration of nature at the teacher education level has an important link to
schools, as according to Powers, “the power of the preservice curriculum is its multiplier
effect. Where one teacher has the potential to impact the number of students taught
throughout a career, a methods course has the potential to impact many future teachers
and, ultimately, a far greater number of students” (Powers, 2004). Based on several
reports there are a number of teacher education institutions in Ontario that are struggling
in emphasizing a holistic understanding of environmental education (Puk & Stibbards,
2012; Blakey & Madeira, 2014). Many teachers have not had proper training during their
training in these faculties of education, creating a stronger need for schools to offer such
training if they expect teachers to adapt curriculum and teaching methods to using the
outdoor classroom.

There are a number of barriers involved with the use of the garden, mostly
notably its disconnection to the school, its shade, and its unfamiliarity to most of the
community. Due to the garden’s disconnection from the main school, parents and
community members never visit, so there is a lack of awareness of its benefits, potential,
and use. The growing space doesn’t get full sun, making the growing of vegetables
problematic especially over the summer. The garden may also be difficult for teachers to
adopt the use of, as Blair suggests that “the very qualities that render school gardening a
potent and multidimensional experiential learning experience – being outdoors and
involved in hands-in-dirt digging, planting, and cleanup – may render it unpopular with
teachers who prefer the safety, predictability, cleanliness, and ease of the indoor classroom” (Blair, 2009; Graham & Zidenberg-Cherr, 2005).

Defining the integration of nature within the school is problematic, as there are many similar concepts that touch on various aspects of outdoor education. One of the most widely used terms in Ontario is ‘environmental education,’ defined by the Ministry of Education’s document *Shaping Our Schools, Shaping Our Future* as

“education about the environment, for the environment, and in the environment that promotes an understanding of, rich and active experience in, and an appreciation for the dynamic interactions of the Earth’s physical and biological systems, the dependency of our social and economic systems on these natural systems, the scientific and human dimensions of environmental issues, and the positive and negative consequences, both intended and unintended, of the interactions between human-created and natural systems” (MOE, 2007).

Though the Ministry definition is useful as it encompasses many aspects, it is also problematic as it though covers *in the environment as well as rich and active experience in* nature, it does not necessarily call for any contact with nature for a lesson to be involving environmental education. For example, a lesson involving environmental knowledge that is covered through use of a smartboard could be considered environmental education. A related issue is in defining terms for the present study, which has ended up using NBL, ‘contact with nature,’ and ‘nature’ as defined in the introduction, though alternate terms could include environmental education, outdoor education, place-based education, or sustainability education. The report on American independent schools suggests that though only 7% of schools surveyed used a working definition of environmental literacy, only 5% had an environmental literacy requirement, and only 9% had an environmental literacy requirement, though one of the key qualities of the schools who were most successful at integration EE have defined environmental
literacy and used it to revise curriculum (Inverness Associates, 2013). This may be an effective strategy for Montcrest school to develop a working definition of environmental literacy for use in developing curriculum involving NBL.

5.4 Limitations

While the strength of qualitative research lies in attempting to be participant-driven rather than researcher-driven, there were only 7 participants, making the ability to generalize findings from the study to other populations difficult. Though participants’ confidentiality is maintained, their responses may still have been limited in their critical nature due to the participants’ ongoing employment. Participants each have a representative perspective of that of their classes, but their perspectives will not necessarily reflect those of all staff or teachers as their experiences may be different. Finally, the study acknowledges the impossibility of objectivity and thus attempts to divulge personal and theoretical involvement of the researcher, but in accord with this understanding the interpretation remains biased and subjective.

5.4 Conclusions

This study lends to existing research on the integration of nature in schools, suggesting that though there is work underway and supports enabling such work, there are clear barriers that are also working against this work.
REFERENCES


SEER (2005). California Student Assessment Project Phase Two: The Effects of Environment-Based Education on Student Achievement. SEER: Poway, CA.


APPENDICES

Appendix A: Baseline Phase Teacher Interview Protocol

Semi-Structured Interview Questions (Teachers)

This study looks at the roles of nature and environmental education at Montcrest school over the course of a year. We are interested in your understanding of the role of nature in your personal and professional life, as well as your understanding of nature-based learning from a professional standpoint as part of the Montcrest staff.

1) What is your educational training?
2) What are your areas of instruction? (i.e., social studies, grade 6)?
3) What have you taught in previous years?
4) How long have you worked at Montcrest?
5) How would you describe your philosophy of education, teaching style, or approach to education?
6) Could you describe your role at Montcrest school, as well as what you feel are the most critical elements in your teaching?
7) How would you describe your connection to nature?
8) In your opinion, what is the role of nature in education at the level you teach?
   a) What is the role of nature in education at other teaching levels?
   b) What is the role of nature in education across primary, junior, and intermediate grades?
9) Do you take your students outside during class? (Y/N) How often and for what purposes?
   a) Can you describe the benefits and challenges of taking students outside for learning?
   b) What do you get personally from taking your students outdoors?
10) Could you please describe your concerns about taking your students outdoors?
11) If you’ve been able to build in nature-based learning into a lesson or unit, could you please describe a lesson or unit that demonstrates how you have built nature-based learning into your teaching? May I have a copy of your lesson or unit plan?
12) If you’ve been able to build in nature-based learning through specific resources, could you please provide some examples of the resources and/or support materials that you use which aids in the integration of nature-based learning?
   a) What techniques do you employ when teaching that allow for the integration of nature-based learning? (e.g., modeling, videos, guest speakers).

13) If you’ve been able to build in nature-based learning through a mentor, colleague, or organization, could you please describe this mentor, colleague, or organization that you’ve used and how it has allowed for the integration of nature-based learning?
   a) Why do you think that this person or organization is a valuable resource?

14) Could you please describe your observations about the influence that nature-based learning activities have on your students?
   a) Could you describe your observations on the influence of nature-based learning activities in terms of students’ cognitive functioning and behaviour?
   b) Could you describe your observations on the influence of nature-based learning activities in terms of students with special needs?

15) What are your observations about your students’ nature-based learning experiences in light of Montcrest’s work with Executive Functioning?
   a) If you’ve been able to build in nature-based learning experiences, could you describe how your students’ nature-based learning experiences affect their Emotional Control, Response Inhibition, or Sustained Attention?

16) Could you describe your level of comfort with taking your students outside on a scale from 1-5 with 1 being not comfortable to 5 being very comfortable?

17) Could you describe your level of confidence with taking your students outside on a scale from 1-5 with 1 being not confident to 5 being very confident?

18) What are the supports and/or barriers you perceive that have an influence on the integration of nature-based learning at Montcrest?

19) How do you perceive the importance that the administration places on the integration of nature-based learning at Montcrest?

20) Do you think parents support the use of outdoor learning spaces for classes at Montcrest?
   a) How is support from parents for the use of outdoor learning spaces manifested?
Appendix B: Baseline Phase Staff Interview Protocol

Semi-Structured Interview Questions (Staff)

This study looks at the integration of contact with nature and environmental education at Montcrest school over the course of a year. We are interested in your understanding of the role of nature in your personal and professional life, as well as your understanding of nature-based learning and environmental education from a professional standpoint as part of the Montcrest staff.

1) What is your educational training?
2) Have you taught in previous years, and if so what did you teach?
3) How long have you worked at Montcrest?
4) How would you describe your philosophy of education, teaching style, or approach to education?
5) Could you describe your role in the school, as well as what you feel are the most critical elements to teaching at Montcrest?
6) How would you describe your connection to nature?
   a) Would you describe nature as being important to you?
7) In your opinion, what is the role of nature in education at the levels you’re involved with?
   a) What is the role of nature in education at other teaching levels?
   b) What is the role of nature in education across primary, junior, and intermediate grades?
8) Can you describe the benefits and challenges of taking students outside for learning?
   a) What benefits do you get personally from taking students outdoors?
   b) What excites you about taking students outdoors?
   c) Could you please describe your concerns about taking your students outdoors?
9) Could you please provide some examples of the resources and/or support materials that you employ which aids in the integration of nature-based learning and environmental education?
10) What mentor, colleague, or organization have you used as a resource for the integration of nature and environmental education?
   a) Why do you think that this person or organization is a valuable resource?

11) Could you please describe your observations about the influence that contact with nature and environmental education activities have on students?
   a) Could you describe your observations of the influence of contact with nature and environmental education activities on students with special needs?
   a) Could you describe your observations of the influence of contact with nature and environmental education activities in terms of students’ cognitive functioning and behaviour?

12) What are your observations about students’ contact with nature in light of Montcrest’s work with Executive Functioning?
   a) Could you describe students’ contact with nature and how it affects their Emotional Control, Response Inhibition, or Sustained Attention?

13) What are the supports and/or barriers you perceive that have an influence on the integration of nature-based learning and environmental education at Montcrest?

14) How do you perceive the importance that the administration places on the integration of nature-based learning and environmental education at Montcrest?

15) Do you think parents support the use of outdoor learning spaces for classes at Montcrest?
   a) How is the support from parents regarding the use of outdoor learning spaces for classes manifested?
Appendix C: Implementation Phase Teacher Interview Protocol

Semi-Structured Interview Questions (Teachers)

This study looks at the roles of nature and environmental education at Montcrest school over the course of a year. We are interested in your understanding of the role of nature in your personal and professional life, as well as your understanding of nature-based learning from a professional standpoint as part of the Montcrest staff.

1) How would you describe this past year at school?
2) How has your role at school changed over the past year?
3) Could you please describe any changes to your role at school that you know of for next year?
4) How has the role of nature changed in your personal life since the previous interview?
   a) How has the role of nature changed in your family life since the previous interview?
5) Could you describe any changes regarding the school’s approach to nature and environmental education that you’ve seen in the past year?
   a) Could you describe any changes regarding the school’s approach to nature and environmental education during class time that you’ve seen in the past year?
   b) Could you describe any changes regarding the school’s approach to nature and environmental education during extracurricular activities that you’ve seen in the past year?
6) Could you describe any changes regarding students’ connection to nature that you’ve seen in the past school year?
7) Could you describe any changes regarding your own approach to nature-based learning in school that you’ve experienced in the past year?
   a) How has your connection to nature changed over the past school year when you go outside with your classes?
   b) How has your view of the benefits and challenges of taking students outside for classes changed over the past school year?
8) If you’ve been able since the previous interview to build nature-based learning into a lesson or unit, could you please describe a lesson or unit that demonstrates how you have built nature-based learning into your teaching?

9) If you’ve been able since the previous interview to build in nature-based learning through specific resources, could you please provide some examples of the resources and/or support materials that you use which aids in the integration of nature-based learning?
   a) What techniques have you employed recently when teaching that allow for the integration of nature-based learning? (e.g., modeling, videos, guest speakers).

10) If you’ve been able since the previous interview to build in nature-based learning through a mentor, colleague, or organization, could you please describe this mentor, colleague, or organization that you’ve used and how it has allowed for the integration of nature-based learning?
   a) In what way do you think that this person or organization is a valuable resource?

11) Could you please describe your recent observations about the influence that nature-based learning activities have had on your students?
   a) Could you describe your recent observations on the influence of nature-based learning activities in terms of students’ cognitive functioning and behaviour?

12) What are your recent observations about your students’ nature-based learning experiences in terms of Executive Functions?

13) Could you describe your current level of comfort with taking your students outside on a scale from 1-5 with 1 being not comfortable to 5 being very comfortable?

14) Could you describe your current level of confidence with taking your students outside on a scale from 1-5 with 1 being not confident to 5 being very confident?

15) What are the supports you currently perceive that influence the integration of nature-based learning at Montcrest?
   a) Do you have any suggestions for enhancing the current supports that aide in the integration of nature-based learning at Montcrest?

16) What are the barriers you currently perceive that influence the integration of nature-based learning at Montcrest?
a) Do you have any suggestions for addressing the current barriers in order to aid in the integration of nature-based learning at Montcrest?

17) How do you currently perceive the level of support among your teaching colleagues for nature-based learning at Montcrest?

18) How do you currently perceive the importance that the administration places on the integration of nature-based learning activities at Montcrest?

19) How do you currently perceive support from the Board of Governors for nature-based learning activities as being important to a Montcrest education?

20) How do you currently perceive parent support for nature-based learning activities at Montcrest?

   a) How is recent support from parents for nature-based learning activities manifested?
Appendix D: Baseline Phase Consent Form

Staff Perspectives on the Integration of Contact with Nature and Environmental Education at Montcrest School

Primary Investigator: John Benjamin Blakey
Teacher / Researcher, Montcrest School

Staff Information and Consent Form

The purpose of this study is to investigate the perspectives of staff regarding the integration of contact with nature and environmental education at Montcrest school. I am interested in your experiences related to teaching and education, and will be looking primarily at your understanding of the integration of nature in the school in terms of curriculum and programming. I want to know about any experiences related to your teaching, as well as both complimentary and critical opinions you may have about nature-based learning as well as your experiences at Montcrest. By participating in this study you will help me to gain a better understanding of the current state of the integration of contact with nature and environmental education at Montcrest, in the hopes of identifying factors that influence the integration of contact with nature and environmental education in schools, so that this problem can be better understood within social scientific research literature.

I would like to conduct a second interview with you that will last approximately 40 minutes but may go longer depending on your answers. The interview will consist of a series of open-ended questions in which you are invited to respond to freely based upon what you think is important according to broad research questions. The interview will be recorded by digital voice recorder and the researcher will write notes during the process to improve analysis.

In almost all cases, your engagement in this research study will bring you no risks beyond anything that you would find in daily life. The researcher will strive to create an ideal opportunity for the interview in a safe and comfortable place where you will be able to relate your experience without fear of danger or bias.

Your engagement with this research study is voluntary. You may decide not to respond to any questions being asked, and you have the full capability to end the interview when you so choose. If you decide to decline your permission during the interview, any data collected including the audio recording and all written notes will be not be used in the research study and will be destroyed immediately.

You may withdraw your participation and all data pertaining to your interview at any point before the study is completed.

Any information that you give me during the interview will be kept strictly confidential. Audio files and written transcripts will remain on a secure computer.
files will be encrypted so that only the researcher will be able to access them. Written copies of transcripts and notes will be kept in a secure location where only the researcher involved may have access. All of your data will be destroyed five years after the analysis of the research study is finished.

Audio recordings will be taped with the express permission of the participant. All of your information will remain anonymous. Audio recordings and transcripts of the interviews will be coded in order to keep your anonymity. Only the researcher involved in this research study will listen to the audio files to be able to transcribe and analyse your experiences.

The audio files will not be played for anybody except the researcher directly involved. No identifying information besides the coded number will remain on the audio file.

Your information will be used only for the understanding of aspects of your experience related to the integration of nature and environmental education at Montcrest school, and will be used solely for analysis in this research study after it has been coded and personal identification has been removed.

I intend to use the information you provide to write a scholarly article about the research conducted in the present study, and I ask that you allow me to use non-identifying quotes from the transcript of your interview if they contribute to the writing process.

The researcher acknowledges that he has no commercial interest in this study. If there are any questions that may arise during the course of the interview please don’t hesitate to ask. If you have questions after the interview has been completed, please contact the primary investigator using their contact information above.

Please read the following statements carefully:

- I have been informed as to the nature and the purpose of this study as described above.

- I understand that my involvement in this research study is voluntary and that I am able to retract my engagement at any point during the course of interview or analysis.

- I understand that my information will be kept private and confidential.

- I agree to participate in the interview and I allow my interview to be audio-recorded.

- I allow the information given in the interview to be used in the analysis of this research study.

- I allow non-identifying quotes spoken during my interview to be used in any publication involving the results from the present study.

- I understand that the research study has been reviewed for ethical approval by the Office of Research Ethics at the University of Toronto.
• I have been given a copy of this consent form.

By signing my name below I agree to have read and understood the information in the consent form and that I willingly give my informed consent to participate in this study.

Name (please print): _________________________________

Signature: _________________________________________

Date: _____________________________________________

_____ I wish to receive a copy of the transcribed audio interview so that I may review it for accuracy before it is used in the research.
Appendix E: Implementation Phase Consent Form

Montcrest School

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Primary Investigator: John Benjamin Blakey
Teacher / Researcher, Montcrest School

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In almost all cases, your engagement in this research study will bring you no risks beyond anything that you would find in daily life. The researcher will strive to create an ideal opportunity for the interview in a safe and comfortable place where you will be able to relate your experience without fear of danger or bias.

Your engagement with this research study is voluntary. You may decide not to respond to any questions being asked, and you have the full capability to end the interview when you so choose. If you decide to decline your permission during the interview, any data collected including the audio recording and all written notes will be not be used in the research study and will be destroyed immediately.

You may withdraw your participation and all data pertaining to your interview at any point before the study is completed.

Any information that you give me during the interview will be kept strictly confidential. Audio files and written transcripts will remain on a secure computer.
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The audio files will not be played for anybody except the researcher directly involved. No identifying information besides the coded number will remain on the audio file.

Your information will be used only for the understanding of aspects of your experience related to the integration of nature at Montcrest school, and will be used solely for analysis in this research study after it has been coded and personal identification has been removed.

I intend to use the information you provide to write a scholarly article about the research conducted in the present study, and I ask that you allow me to use non-identifying quotes from the transcript of your interview if they contribute to the writing process.

The researcher acknowledges that he has no commercial interest in this study. If there are any questions that may arise during the course of the interview please don’t hesitate to ask. If you have questions after the interview has been completed, please contact the primary investigator using their contact information above.

Please read the following statements carefully:

• I have been informed as to the nature and the purpose of this study as described above.

• I understand that my involvement in this research study is voluntary and that I am able to retract my engagement at any point during the course of interview or analysis.

• I understand that my information will be kept private and confidential.

• I agree to participate in the interview and I allow my interview to be audio-recorded.

• I allow the information given in the interview to be used in the analysis of this research study.

• I allow non-identifying quotes spoken during my interview to be used in any publication involving the results from the present study.

• I understand that the research study has been reviewed for ethical approval by the Office of Research Ethics at the University of Toronto.
I have been given a copy of this consent form.

By signing my name below I agree to have read and understood the information in the consent form and that I willingly give my informed consent to participate in this study.

Name (please print): ____________________________

Signature: ____________________________

Date: ____________________________

I wish to receive a copy of the transcribed audio interview so that I may review it for accuracy before it is used in the research.
I enjoyed school, for the most part, though I always questioned the relevance of the curriculum. I never truly learned how to process and problem solve at a higher, independent level until I entered college. I received my undergraduate degree in elementary education through a nontraditional site based program. The majority of the teaching and learning took place in an urban elementary school.

Teaching Challenges My first teaching assignment was at an urban middle school teaching 6th grade science and social studies. Because of my training, I was ready for the assignment and knew exactly how I wanted my class to function.