NATURE, NURTURE, KNOWLEDGE:
THE PROMISE OF EXPERIENTIAL LEARNING
FOR STUDENTS WITH SPECIAL NEEDS

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Kara Marie Peterson
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Abstract

Nature, Nurture, Knowledge:
The Promise of Experiential Learning for Children with Special Needs

Research suggests that many students learn best when teaching practices are outdoors, nature-based, and experiential. Meaningful outdoor experiences increase students’ social and academic achievement and contribute to the development of critical thinking and problem-solving skills. Experiential and nature-based instruction in the outdoors has been shown to reduce poor behavior and increase academic achievement.

Despite the research, and perhaps due to increased accountability requirements and stagnant pedagogical practices, students continue to be taught by traditional means in traditional locations. Students enrolled in the Barnstable Horace Mann Charter School Intense Learning Center are no different in that they may benefit from experiential, nature-based, and outdoor education. These students have been diagnosed with autism, intellectual disabilities, neurological impairments, and combined deficits. As a result of multiple disabling conditions, combined with the pedagogical practices in place, students in the Barnstable Horace Mann Charter School Intense Learning Center are often unable to grasp facets of the curriculum and display poor behavior requiring physical interventions.

The purpose of the study was to determine the impact “Nature, Nurture, Knowledge”, an outdoor, nature-based, experiential program had on the behavior of BHMCS Intense Learning...
Center students. The research study utilized a single subject approach in that each student participant was tracked individually. Five students participated in the study. Four boys and one girl, all enrolled in the Barnstable Horace Mann Charter School Intense Learning Center, engaged in the study over a three month period.

The methodology employed was that of a mixed methods approach. Student behavioral data was collected for analysis during and absent the treatment in an intervention-baseline-intervention format. Both quantitative and qualitative data were collected over three periods of time. The first period was that of the intervention in which “Nature, Nurture, Knowledge” was applied, the second period, three weeks in which the intervention was removed, and finally, a third period of intervention to which “Nature, Nurture, Knowledge” was applied.

Data collected throughout the study demonstrated a varied response to the intervention. When the intervention was applied some of the students demonstrated marked improvements in behavior and affect while others resisted the program to the extent of non-participation. Data collected absent the intervention showed equally varied results between students. Overall, the key elements affecting the outcomes of the study may have been influenced by teacher participation and student attitude, nevertheless, the intervention serves as a model or pilot program for future use or study.

Lessons learned from the implementation of “Nature, Nurture, Knowledge” may be applied to future programming at BHMCS both within and outside of the ILC. In addition, readers may glean valuable information from the literature review and theoretical frame found
within the Doctoral Project Report and formulate future interventions for students with low-incidence, high-intensity special education needs.
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CHAPTER I
INTRODUCTION

Overview

Children identified with severe special needs at the Barnstable Horace Mann Charter School (BHMCS) are provided services through the Intense Learning Center (ILC). The ILC is a program which provides instruction to children in either self contained or mainstreamed fashion within the school. Children affiliated with the ILC program are described as having high intensity disabilities including autism, neurological impairment, and intellectual disability. Children designated to the program may also have physical disabilities, communication disorders, specific learning disabilities, and display a wide range of intellectual capabilities, academic function, and behaviors. Of utmost importance, students in the BHMCS ILC demonstrate limited academic proficiency and display behaviors which interfere with learning. These behaviors are socially unacceptable and include noncompliance, avoidance behavior, and unprovoked outbursts.

Students in the BHMCS ILC are exposed to traditional forms of instruction which do not incorporate elements of nature. These students require high staff to student ratios due to frequent misbehavior. In addition, staff must address academic difficulties. Research shows that participation in valuable outdoor, nature-based programming elicits increased academic achievement, empathy, comprehension, self-esteem, creativity, ecological awareness, and occurrences of appropriate and positive behaviors (Louv, 2005, p. 203-211). The project
focused on the BHMCS ILC students because of the research and desire to provide a solution to problematic issues found within the BHMCS ILC. In one of many examples, the American Institute for Research’s (AIR) (2005) study, “The Effects of Outdoor Education Programs for Children in California,” reveals that, “Participation in outdoor school was associated with higher ratings of conflict resolution skills and cooperation” (p. vii).

Problem of Practice

The educational gap, or problem of practice, therefore, is that students in the BHMCS ILC have limited academic success and display socially unacceptable behavior within the confines of public school. High intensity special education students, already requiring unique instruction, are particularly affected by teaching practices which favor recitation, regurgitation, and traditional assessment. Behavior issues, which present serious obstacles to learning among students diagnosed with high intensity disabilities, continue to rise with current practices and programming. Conventional instructional methods, which do not include outdoor, nature-based, or experiential teaching methods exacerbate the incidences of decreased student achievement and maladjusted behavior.

Significance

The problem of practice is significant because youngsters, when unable to succeed in public settings, require costly out-of-district placements. Children, when identified as having unique educational needs, are often unable to grasp curricula in public schools because instruction therein occurs most often via traditional means. Information on students with low-
incidence, high intensity special education needs is limited in regard to the impact of outdoor, nature-based, and experiential programming. Thus, while research does suggest that pedagogical practices should include elements of nature and take place in the outdoors for typical youngsters, a need exists for more information on the impact of such practices with students with unique special needs. Unfortunately, the educational community closely mirrors society which is teaching young people to avoid nature and fear the outdoors (Louv, 2005). When educational facilities do incorporate the outdoors and instructional practices include elements of nature, students have been shown to be more successful both academically and socially. Students who are academically, socially, and emotionally successful, are easily maintained within the public school setting and therefore, the need to seek alternative placement is avoided. Thus, by meeting the needs of youngsters within public education settings, out-of-district student placement is averted. Ultimately, the reduction of outside placements avoids increased expense in public education.

The cost of educating special education students is on the rise. In March of 2009, Matthew Deninger and Robert O’Donnell provided a report to the Massachusetts Department of Elementary and Secondary Education noting that more than 10,000 students with disabilities, about 1% of the total student population and 6% of the total population of students with disabilities, were placed in out-of-district programs. Sheldon Berman, Perry Davis, Ann Koufman-Frederick, and David Urion note, “Between FY90 and FY99, expenditures for special education increased at a greater rate than expenditures for regular education in 88% of
Massachusetts school districts” (p. 188). With the cost of special education higher than that of regular education, a need for programming that targets specialized populations will become increasingly important. Should traditional educational practices continue for high intensity special education students, the need for out-of-district placements may increase and therefore exacerbate the rising cost of education.

Striving to educate high intensity special education students within the public education sector in order to minimize educational expense is significant. John Dewey notes the need for experiential learning opportunities and the value of hands-on learning in nature (Dewey, 1915). Howard Gardner refers to multiple intelligences and the need for student exposure to various modalities of instruction in order to be successful (Gardner, 1999). Richard Louv implores practitioners and parents to reintegrate nature into student learning to effect positive behavior and achievement in youngsters (Louv, 2005). Despite the work of noted researchers and theorists which supports the practice of hands-on, nature-based instruction, the use of traditional teaching practices in the BHMCS ILC continues. Students with unique special needs deserve the opportunity to be successful via the integration of the aforementioned instructional strategies. Therefore, for moral and ethical reasons, the need to improve student achievement serves as another significant issue surrounding the problem of practice.

Purpose of the Study

The purpose of the study was to determine what impact the implementation of “Nature, Nurture, Knowledge”, a program by which students in the BHMCS ILC are exposed to outdoors,
nature-based, and experiential learning opportunities, had on youngsters academically and behaviorally. The study sought to understand what real and perceived changes in academic and behavioral performance occurred when students were exposed to the intervention. The study reviewed impacts as seen through the students and practitioner’s lens via quantitative and qualitative data analysis.

Research Questions

The research project explored the following questions:

1. What impact does an outdoor, nature-based, experiential program have on the academic proficiency levels of students with significant disabilities?

2. What impact does an outdoor, nature-based, and experiential education program have on the behavior of students with high intensity special education needs?

3. To what extent do students perceive the benefit (or not) of participation in “Nature, Nurture, Knowledge” on learning and behavior?

4. To what extent do staff perceive the academic benefit (or not) of teaching of science and English language arts occurs outdoors, in a nature-based, and experiential way?

5. To what extent do staff perceive the behavioral benefit (or not) of teaching science and English language arts occurs outdoors, in a nature-based and experiential way?

6. In what ways do staff differentiate (or not) the benefits between science and English language arts when taught using outdoor, nature-based, and experiential methods?

Ultimately, the study allowed me, as the researcher, to document and share student academic and
behavioral outcomes as a result of participation in “Nature, Nurture, Knowledge”. In addition, the study enabled me to complete a program evaluation through the collection of staff opinions and commentary.

Theoretical Framework

Theories pertaining to nature-based and experiential learning served as the framework by which the problem of practice was examined. Reviewing and comparing the teaching practices currently in use within the BHMCS Intense Learning Center against available research surrounding nature-based instruction and experiential learning ensured valuable insight into the development of “Nature, Nurture, Knowledge”. Theories surrounding nature-based instruction, and the efforts of educators to provide methods by which students may access the curriculum, avoid socially unacceptable behaviors, and achieve success in public settings, have been valuable components of the research.

Experiential Learning

The value of experiential learning opportunities is well documented. Since the time of early European theorists, including Friedrich Froebel, Johann Herbart, and Johann Pestalozzi, the importance of learning through experience has been touted. Froebel, the father of modern day kindergarten, advocated active learning and encouraged the use of toys, also known as “gifts” for learning. Herbart, the father of pedagogy, advocated methods of instruction and encouraged critical thinking rather than recitation and regurgitation. Finally, Pestalozzi, a child-centered teacher, relied on teaching through the senses and utilizing the natural environment as an
instructional tool.

The roots of American education were conservative in nature and far less romantic than that of the European theorists. Leaders in early American education included Thomas Jefferson, Horace Mann, and Catherine Beecher. Jefferson, a strong advocate for the education of all children, argued for free public school. Further, Jefferson believed in advanced education for those rising from the masses (Mondale and Patton, 2001). Mann, working to ensure students received quality education in civilized institutions, wanted to provide uniformity among schools. Mann also advocated that public schools be supported through public funds. Beecher promoted the idea of women as teachers. She encouraged the spread of young women into the avocation and recognized and supported the role of women as teachers in the westward expansion. All three early American leaders were proponents of creating schools which allowed for students to grow academically and are credited with the development of our current day public school system (Mondale and Patton, 2001). The ideas and practices bestowed, however, were not considered progressive.

With the role, design, and support of public education firmly established in the 1900’s, the art and practice of teaching came to the attention of scholars such as John Dewey. Dewey explained the need for students to be actively involved in learning and advocated for teaching techniques which would engage the mind, body, and soul. Most important, and in direct correlation with the research, Dewey promoted the use of experiential, hands-on, and nature-based instruction and was viewed as a leading progressive in the field of education.
In *The School and Society*, John Dewey (1915) wrote, “No number of object-lessons...for the sake of giving information, can afford even the shadow of a substitute for acquaintance with plants and animals of the farm and garden acquired through actual living among them and caring for them” (p. 8). Dewey’s work illuminates a way in which to measure current practices against ideal or proposed models of education. Dewey suggests that students need to be actively involved in the learning process and experiencing nature - the antithesis of current practices utilized within the BHMCS ILC. Utilizing a hands-on approach to teaching and learning is a well established theory. It is generally recognized that students learn best when doing, whether actively and physically engaged in instruction or, in fact, teaching others.

Dewey’s work illustrates the historical significance of early schooling in which the purpose of a free and public education was to ensure a populace able to read and write and, ultimately, able to contribute as a member of a democratic society. With the basic founding premise of the need for and role of public education well established, the art and science of teaching became one of the most important components of Dewey’s contribution to the practice of education. In 1915, Dewey pointed out that, “from the standpoint of the child, the great waste in the school comes from his inability to utilize the experiences he gets outside the school in any complete and free way within the school itself; while, on the other hand, he is unable to apply in daily life what he is learning at school” (p. 46). This remarkable quote continues to be timely and thought-provoking nearly a century later. Children, today, often do not feel that public education is meaningful in terms of connections with their everyday lives. Within the confines
of BHMCS, students often do not feel that their academic lessons and experiences at school have purpose and usefulness in the “real” world. Students consistently question the value of education and have difficulty connecting the lessons received within the school walls to the realities of life outside of the classroom.

**Progressivism**

John Dewey represented a new school of thought and is recognized as one of education’s first progressive movement scholars. Dewey and other progressives believed in breaking away from old-style teacher-centered practices and encouraged the development of student-focused, experiential classrooms. Progressives advocated experiential teaching practices not only as a means to more efficiently educate children, but also as a way in which to address and mitigate societal problems of the day. Today, we are immersed in an educational climate which supports, promotes, and in many ways, is designed around high-stakes testing and assessment. With the advent of the No Child Left Behind Act (NCLB) and a belief that Americans are losing ground, the education community has reverted from a progressive mindset back to a more traditional approach to learning and learning which values well-established curriculum and old-fashioned pedagogical practices.

Currently, contrarian scholars and educators have started to circle back to learning-by-doing theories and have begun to contend that studies such as *A Nation at Risk* do not accurately portray American education. Like the pendulum of a clock, leaders, practitioners, and educational scholars, such as Diane Ravitch, are swinging back to educational transformation
initiatives and even recanting the value of previously espoused mandates such as NCLB.

Experiential learning, inclusive of nature-based education, may very well become a twenty-first century pedagogical practice and sought-after educational paradigm as more leaders, scholars, and practitioners follow Ravitch’s lead.

**Pedagogical Practices**

Experiential learning or, learning by doing, is a key component of the theoretical frame by which the study has been aligned. When students are truly engaged in learning, and actively participate in their education, learning may become deeper and more meaningful to the recipient.

David Kolb, a well known professor and noted expert on experiential learning, serves as a key figure in the examination of the theory of experiential learning. The premise of experiential learning is that participants actively engage in the learning model. Kolb, along with Roger Frye, created a model of experiential learning which is comprised of four elements: concrete experience, observation and reflection, the formation of abstract concepts, and testing in new situations (Smith, 1996). This model is based on the assertion that students require a real experience in which to begin the learning process. Following the actual experience, the second step is when students must observe and reflect upon the event. The third step, formulation of abstract concepts, and the fourth and final step, applying the learning to new events, are most difficult. The experiential learning model, however, holds much promise for youngsters who are more concrete than abstract thinkers. Experiential learning is, in essence, learning by doing, reflecting on the activity, and then applying the new information to future events. Experiential
learning is most often thought of as an instructional method which requires the student to come into direct contact with the subject being studied. Experiential learning lends itself well with teaching in the outdoors and with nature-based lessons, and, specifically, for students with high intensity special education needs.

*Nature in Education*

The lack of nature in the world of twenty-first century education is profound. An emphasis on the latest technological gadgets overrides the value of digging in the dirt, exploring natural surroundings, and enjoying the world around us. Richard Louv’s book, *Last Child in the Woods*, published in 2005, identifies the role of nature in education. Throughout his book, Louv examines the lack of nature within schools and daily living. The reader is given a wide array of examples concerning the linkages between healthy living and learning with the integration of nature. Louv (2005) coined the term “nature-deficit disorder” to describe the ill effects on children as a result of the lack of exposure to nature. “Nature deficit disorder” is not a medical or psychological diagnosis, the end result, as described by Louv is “…the human cost[s] of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses” (p. 36). Many children and adults are out-of-touch with nature and the outdoors and have grown accustomed to the conveniences of modern day living to the extreme. Sadly, plucking a chicken, cleaning a fish, and harvesting wild berries and fruits are seen as a foreign industry among many in our society. Those who engage in hunting, fishing, and gardening are generally viewed as unique, industrious, and someone from a
bygone generation.

Louv, in his studies, found that youngsters today are disassociated with nature. In addition, children exhibit a pervasive fear of the outdoors inclusive of traffic, crime, strangers, and nature itself (Louv, 2005). The value of allowing youngsters opportunities to engage with nature is multi-faceted. Children engaged with nature may reduce stress levels and minimize symptoms of Attention Deficit Hyperactivity Disorder (ADHD), develop a natural curiosity for the outdoor world, increase stewardship for the environment, minimize poor physical health, and increase emotional health. With many benefits of nature articulated in his book, the question of why educators are not partaking in more experiential and nature-based instruction looms large. Unfortunately, political and public interest in education appears to be overshadowed by the overall local, federal, and global economy. Despite the political climate, the need to address student learning has not faded among educators. The time to move forward with exciting opportunities for youth is now.

Methodology Overview

The research study utilized a mixed methods approach (Creswell, 2009) meaning both quantitative and qualitative data were collected, recorded, and analyzed. Using a single-subject design, five students were identified as subjects for the study and an analysis of the impact a particular teaching practice had in regard to academic performance and social skills was resultant. In order to accommodate the needs of the research study a design model was utilized and followed an intervention, removal of intervention, intervention model identified as a

The research study occurred within the confines of the BHMCS campus and spanned over three months. Multiple forms of data were collected in three distinct time periods by BHMCS staff members who served as research personnel. Academic and behavioral data on each student was gathered and dictated by internal and external instruments. Interviews of participants, staff, and parents and guardians added to the data set.

Delimitations / Limitations

Delimitations of a study are the characteristics that limit the scope and boundaries of the inquiry through the conscious exclusionary and inclusionary decisions (Cline and Clark, 2006). A significant delimitation within the “Nature, Nurture, Knowledge” study was that of reviewing academic and social impact on students. Additionally, further limiting the study was the fact that only the students enrolled in the BHMCS ILC were included as subjects. The research questions were confined to the ways in which academic achievement and behavior was impacted. The inclusion of students with similar disabilities, found in the grade four and grade five BHMCS Intense Resource Rooms (IRR) could have been included; however, as a delimitation, the study focused only on BHMCS ILC students.

Limitations of a study are the characteristics of the methodology that set parameters on the interpretation of the results and establish internal and external validity and Generalizability (Cline and Clark, 2006). The most obvious limitation of the “Nature, Nurture, Knowledge” research project is that of drawing conclusions from the sample data to larger populations in
different settings. The internal validity of the study comes into question in that the study was flawed in multiple ways. First and foremost, the lead teacher within the classroom was out of the building due to medical needs which impacted the daily instruction. Substitute teachers and substitute paraprofessionals served well; however, their presences provides an internal dilemma.

Summary

The application of theories pertaining to nature-based and experiential learning to the study served as a lens by which a comprehensive examination of the research project occurred. Through the framework, the problem of practice was examined and teaching practices examined. “Nature, Nurture, Knowledge”, the title of the research study, was tempered by the base of knowledge found within the various theories articulated. Ultimately, the research study within the BHMCS ILC program relied heavily on theories of practice.
CHAPTER II
LITERATURE REVIEW

Introduction

A thorough literature review has provided insight into what is already known about outdoor, nature-based, and experiential learning as well as what might be more clearly understood. While much has been written in regard to the value of outdoor education and experiential, nature-based learning opportunities for youngsters, less information is readily available in regard to the implementation of such programming for students with significant disabilities. While the notion of outdoor, nature-based, experiential education is not new, few students with significant special education needs appear to have been studied. The study provided, reveals how BHMCS ILC students were impacted when exposed to non-traditional forms of instruction which were outdoor, nature-based, and experiential.

Theoretical Frame

The theoretical frame which serves as a lens by which the literature review was conducted focuses on non-typical pedagogical practices. The traditional format of teaching within the brick and mortar of a school building, utilizing traditional readings, worksheets, and assessments contributes to the problem of practice. After developing a well-defined topic, significance, and potential resolution, various theories on teaching and learning ensured. The following work articulates the knowledge base regarding atypical forms of instruction and the academic and social benefits each has. These methodologies drove the implementation of
“Nature, Nurture, Knowledge” and serve as a platform for the extensive literature review.

Literature Review

A comprehensive review of literature surrounding outdoor education, nature-based education, and implications of time spent outdoors was conducted. Research includes the work of noted theorists as well as scholar practitioners. Further, a comparative review of the problem of practice is provided. A wealth of information is available through a variety of means and information continues to surface as a move toward progressive education which includes the outdoors has become more commonplace.

The Effects of Outdoor Education

Student academic achievement and behavior improve through participation in outdoor programming. The American Institute for Research’s (AIR) (2005) study, “The Effects of Outdoor Education Programs for Children in California,” provides a significant amount of information on the use of outdoor education. The AIR study reviewed outdoor programming for at-risk sixth graders. The authors of the study revealed that “Participation in outdoor school was associated with higher ratings of conflict resolution skills and cooperation” (p. vii). In addition, children who attended outdoor school significantly raised their science score by 3 points as measured by a pre and post survey (AIR, 2005). These findings demonstrate that students are positively impacted when able and allowed to participate in outdoor programming. Experiential learning, as noted within the theoretical frame, has been well-documented to improve the behavior and academic achievement of youngsters. The study conducted at BHMCS with
students enrolled in the ILC proved similar results. The students, neurologically, developmentally, and intellectually impaired requiring specialized instruction, displayed similar results as to ones articulated in the AIR study.

Closing the Achievement Gap

Gerald Lieberman and Linda Hoody’s (1998) research, “Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning,” provides further evidence that exposure to meaningful outdoor experiences increases student social and academic achievement. Lieberman and Hoody (1998) note that at Little Falls High School in Little Falls, MN, “students in the environment-based program have 54% fewer suspensions than other 9th graders” (p. 15). Furthermore, students involved in Environment as an Integrating Context (EIC), a program that integrates best-practices into the natural and socio-cultural environment, academically outperform their peers in traditional programs (Lieberman and Hoody, 1998). Lieberman and Hoody’s research offers additional evidence that outdoor experiences lead to behavioral and academic success and served as a reference for the study conducted at BHMCS. Students at Little Falls High School, because of their involvement in outdoor education, and specifically EIC, increased their social and academic achievement. The work of Lieberman and Hoody further supported the study of students exposed to outdoor, nature-based, and experiential curricula. The work of Lieberman and Hoody is especially meaningful given that BHMCS ILC students require unique and specialized instruction to meet academic goals and minimize behavioral problems. The research honed in on ways in which significantly impaired youngsters
faired when exposed to Lieberman and Hoody’s work in a unique setting.

The Work of Howard Gardner

Another researcher, closely linked with experiential learning, and an important figure in the existing literature is noted psychologist Howard Gardner. Gardner, a prominent author, researcher, and professor at the Harvard Graduate School of Education, made ground-breaking advances with his book *Frames of Mind: The Theory of Multiple Intelligences*. Of significant note, Gardner has expanded his seven previously identified areas of intelligences including: linguistic and verbal intelligence, logical intelligence, spatial intelligence, body / movement intelligence, musical intelligence, and intrapersonal intelligence (Fleming, accessed May, 2010) to include an eighth area, “naturalist intelligence.” This form of intelligence “enables human beings to recognize, categorize and draw upon certain features of the environment” (Gardner, 1999, p. 48).

Gardner’s theory of multiple intelligences, first introduced twenty-five years ago, changed the way educators and psychologists viewed intelligence. Gardner carved out a path for measuring and celebrating students’ intellect without utilizing multiple standardized intelligence tests. Standardized intelligence quotient (IQ) tests, according to Gardner, favored those with mathematical and logical strengths (Gardner, 1999). Prior to Gardner’s notable work, educators essentially measured students’ intelligence with an eye to test scores. Educators today recognize that students demonstrate strengths, proficiencies, and intelligences in many areas beyond the confines of standardized IQ tests.
Following Gardner’s groundbreaking theory, which evolved from others’ work before him, educators began to understand the value of implementing teaching practices that incorporated verbal, auditory, and kinesthetic methods. Literature supports Gardner’s multiple intelligences theory and practitioners have come to believe that students learn better, and more deeply, when instruction incorporates the eight different intelligences and makes use of students’ predisposed learning styles and strengths. Whereby many educators previously relied on verbal or written forms of instruction, Gardner brought to light the importance of using multiple modes of instruction. Gardner’s work illuminates the need to use language, mathematics, pictures, physical activities, music, group work, and nature in instruction which was the goal of the research study.

Gardner’s theory, while not new, is important, as it speaks to the ways in which students learn. With the introduction of “naturalist intelligence”, the importance of implementing nature into instruction has gained significance. Naturalist intelligence, or the innate understanding of nature, is a critical piece of tapping into the ways in which students learn. Ronnie Durie (1999) explains Gardner’s theory when he writes, “The core of naturalist intelligence is the human ability to recognize plants, animals and other parts of the natural environment… All of us can do this but some kids… excel at this pursuit.” (p. 1). Durie’s commentary regarding Gardner’s “natural intelligence” presents added credibility to the use of experiential and nature-based learning opportunities in instructional practices. Gardner’s work, and in particular, his interest in various forms of intelligences, dovetailed well with the implementation of a nature-based
program for youngsters enrolled in the BHMCS ILC who demonstrate substantial disabilities.

*Time on Learning*

A thorough investigation into the time students spend outdoors and engaged in unstructured play has also played an important part in the literature review. Understanding the implications of the No Child Left Behind (NCLB) Act, inclusive of the implementation of multiple student assessments to measure proficiency, has been important.

Educators continue to be confronted with the need to measure student academic proficiency in reading, writing, and mathematics because of NCLB. The reality is that many children who are proficient in the arts, science, and nature may not excel in state and federally mandated testing

NCLB requires that individual states implement assessments and measure student success in the areas of reading and mathematics. Students must demonstrate proficiency in both areas through state-sanctioned assessments in grades three through ten. As a result of the implementation of NCLB, some would argue that many educators focus more attention on English language arts and mathematics than on other core content areas, including science and social studies. In addition to countless hours devoted to the study of reading, writing, and mathematics, the use of instructional time in school has been skewed toward desk-work. In some cases, drilling and test preparation occupies much of the school day. Investigation has revealed that educational policies and standardized testing mandates have driven schools to decrease students’ time in the outdoors and engaged in free play.
Student Learning Time Regulations, as instituted in the Massachusetts Education Reform Act of 1993, caused the elimination of unstructured learning time. The Massachusetts Department of Elementary and Secondary Education (MA DESE) noted that 28.8% of elementary schools and 2.1% of secondary schools, reduced recess time since the inception of the Education Reform Act (Massachusetts D.E.S.E., 1998). The Center on Educational Policy (2007) also recorded that 22% of districts identified as having one school “in need of improvement” and 19% of districts identified as having no schools “in need of improvement” reduced recess time by 60 minutes and 45 minutes respectively, as a result of NCLB (National School Board Association, 2007). The loss of time spent outdoors, as attributed to federal and state testing regulations, continues to exacerbate the problem of practice. The use of experiential and nature-based teaching strategies has been pushed aside because these techniques are viewed as labor and time intensive. Ultimately, however, students requiring specialized instruction, and having documented cases of impairment, may benefit from the notable changes in instruction as proposed in my doctoral project.

Place Based Education

David Sobel, author and co-director of the Center for Place-Based Education at Antioch New England Graduate School, illustrates the need for children to be involved with nature. Sobel (2008) writes, “The sophisticated processes of critical thinking, problem-solving, and kinesthetic coordination appropriately mature out of children’s interaction with concrete materials, caring adults, and thoughtfully managed groups of peers. Luring children into the
world of pure information and electronic images alienates them from experience and disembodies their learning” (p. 69). Sobel further delineates the deterioration and loss of our love of nature with the term “ecophobia” (Louv, 2005, p. 134). Children with ecophobia, according to Sobel’s definition, may be saturated with environmentally friendly practices yet withdrawn from action due to the fear of the loss of natural resources. Rather than face the realities of a spoiled environment, Sobel counters that students may, in fact, retreat rather than face consequences. Sobel posits that the integration of nature into learning may ultimately avoid ecophobia and provide children opportunities for deeper learning.

Sobel’s place-based education incorporates instructional practices which are different from typical classroom experiences. Specifically, Sobel’s work advocates introducing youngsters to the wonders and joy of the outdoors not through reading or watching, but rather, through active engagement. The work of Sobel proved significant in the study in that the premise of removing students from the confines of the classroom and into the outdoors served as the overarching objective. The successful implementation of the treatment requires that students learn outdoors, through the environment, in an experiential way. Focusing on a child’s love of nature and “developing a child’s academic and social competence” is at the center of Sobel’s noteworthy research (Sobel, 2008, p. 3).

Over Assessment

Lawrence Baines and Ruslan Slutsky examined more typical forms of teaching in their writing “Developing the Sixth Sense: Play” in 2009. Baines and Slutsky studied traditional
models of instruction and argued that chronic academic testing and conventional teaching methods utilized in the United States have impeded proper social and psychological health in students. Furthermore, the authors concluded that the lack of formalized outdoor, nature-based education is responsible for students’ perception of less than enjoyable school days. Nature-based education is inherently kinesthetic and multi-modal, and, therefore, a potential solution to the problem identified by Baines and Slutsky (2009). When confronted with a problem of practice, such as poor academic achievement and the recurrent maladjusted behavioral outbursts demonstrated by students in the BHMCS ILC, the work of Baines and Slutsky surfaces as an opportunity for change and ultimately supported the study.

Technology in the Classroom

Further evidence of the benefit of outdoor educational experience is found in the writing of authors Joanne Olson and Michael Clough. Olson and Clough (2009) advocate in “Keeping it Real: Don’t Forget the Importance of Outdoor Experiences in Nature” the use of meaningful outdoor, nature-based instruction to assist students socially, emotionally, and academically. Additional research on the authors reveals that both feel technology may actually be a detriment to students (Olson and Clough, 2004). The practice of introducing multiple levels of technology into twenty-first century classrooms, while popular, does not allow for outdoor, hands-on, nature-based, or experiential learning. Nature-infused instruction, which is clearly beneficial to youngsters, tends to downplay the importance of technology. Providing meaningful, multi-modal instruction to students, which is inclusive of the outdoors and nature, is an important
twenty-first century skill. Today, a decade into the twenty-first century, educators use technology to elicit learning and, it seems, to demonstrate proficiency in the use of seemingly state of the art practices. Educators, feeling pressure to impart futuristic methods, are missing an opportunity to increase student achievement. Research has demonstrated that a move away from the plugged-in, gadget-filled, electronics classroom is of benefit to students (Louv, 2007, Wilson, 1994). Unfortunately, the practice of logging on and sitting sedentary in front of a computer monitor is on the rise and going outdoors and engaging in nature-based education is unique and unpopular (Olson and Clough, 2004). The work of Olson and Clough supports the premise that unplugging and turning off electronics is a solid instructional strategy which was utilized within the study. As advocated by many, getting one’s hands dirty in the earth may be of benefit to students academically, socially, and emotionally.

Environmental Education

“Better Test Scores Through Environmental Education? Washington Assessment Project Plans to Prove It” by Lynne Ferguson, Tony Angell, and Margaret Tudor (2001), provides details about an experiential nature-based project that supports the identified problem of practice. The authors’ work reveals that incorporating the environment and outdoors into teaching is an effective strategy to increase student achievement. Ferguson, et al. (2001), found that there is strong evidence of improved student learning when youngsters are exposed to instruction in the outdoors. The research Ferguson, Angell, and Tudor conducted provides support to the theory that instructional practices which do not include experiential, nature-based
practices and include chronic academic testing may, in fact, impede students’ personal achievement. Students placed in the BHMCS ILC, like those studied by Ferguson, Angell, and Tudor, are taught within the four walls of the classroom and in a traditional format. Through investigation, Ferguson, Angell, and Tudor determined that these types of customary teaching methods simply do not support proper social and psychological well-being among students.

**Time Outside**

Intensely structured lessons, increasing curricular demands, and health and safety concerns have combined to reduce children’s time outside (Manzo, 2008). Manzo studied the Learning Gate Community School and wrote “Schools Adapting Curriculum to the Outdoors” as confirmation of the benefits experiential and nature-based learning have on children. Within the research, it was determined that children’s time spent outside, even for recess, was limited which resulted in detrimental effects (Manzo, 2008). This practice of reducing time outside and the conclusions Manzo published are all too common. The endless assessment of students and analysis of academic achievement, or lack thereof, is taking a toll. Specifically, students do not engage in outdoor activities and the cycle of fear of the outdoors is being perpetuated. To simply experience the joys of recess, go outside, and enjoy nature without the burden of chronic testing, overly structured lessons, and unsubstantiated fears is a unique experience.

**Comparative Education**

A publication entitled, “Outdoor Education in Senior Schooling: Clarifying the Body of Knowledge,” by Peter Martin (2008), addresses the research topic, or problem of practice, in
another setting: Australia. Comparative education, or the review of what happens in different global educational sectors, is a clear path toward improving local education (Mundy, et al. 2008). Overall, Martin’s work offers an additional angle by which to measure concerns for students within the BHMCS ILC. Like others before, Martin’s research supports the use of experiential education in instructional practices. Martin (2008) notes that Australian students demonstrate social and academic benefit as a result of participation in the Australian Outdoor Education program (Martin, 2008).

In Australia, nature-based or outdoor education is, at times, referred to as “environmental education” and has a prominent place in curriculum policies. “When environmental education is incorporated into the school curriculum, students: learn about the environment, develop skills to investigate and solve issues in the environment, acquire attitudes of care and concern for the environment, adopt behaviors and practice which protect the environment, and understand the principles of ecologically sustainable development” (State of New South Wales through the Department of Education and Training, 1999-2009). Lending further support to the curriculum, the Australian Sustainable Schools Initiative (AuSSI) provides assistance to schools in order to support its vision "for all Australian schools and their communities to be sustainable" (New South Wales through the Department of Education and Training, 2006-2009). The Australian Department of Education and AuSSI provides a wealth of nature-based, outdoor learning opportunities for students.
Andrew Brookes (2002), in his article, “Lost in the Australian Bush: Outdoor Education as Curriculum” explores how students living in an urbanized setting received outdoor, or nature-based education. In his study, Brookes (2002) reviews outdoor educational offerings made available to students living in Victoria. Brookes analyzes the state sanctioned Australian curriculum and raises the question as to whether or not teachers, practitioners, and society, in general, are moving away from outdoor experiences. As Brookes’ (2002) notes, “…although it is a given that a large majority of Australians live in cities, there are reasons to treat the apparent urbanization of Australian consciousness as educationally problematic” (p. 406).

A commitment to outdoor education in Australia is documented through the recognition of state curricula requirements. Students in Australia participate in outdoor or nature-based education in many grade levels; however, a requirement of outdoor education curricula, established in 1987, exists for all students (Brookes, 2002, p. 412). Even before the establishment of mandated outdoor education, schools in Australia were developing and integrating programs which encourage student learning in the outdoors. Outdoor education programs certainly increased in number due to state mandates; however, the Australian interest in nature-based education came before statutes calling for such initiatives. With requirements in place and growing interest in the outdoors, “… most Australian students would at some point during their schooling participate in at least one substantial camping or outdoor education program” (Neill, 2001 p. 2).
Karen Malone and Paul Tranter (2003), authors of “School Grounds as Sites for Learning: Making the Most of Environmental Opportunities” cite ways in which Australian children succeed through a focus on outdoor pursuits. The authors suggest that outdoor environmental learning can manifest itself in many ways. Throughout the study, Malone and Tranter (2003) collected data from Melbourne and Canberra, both cities in southeast Australia. “Five schools, two in Melbourne and three in Canberra, participated, with 10 students at each school from the middle years completing the in-depth interview and mapping components…” (p. 286). The findings of infusing play and nature into the curricula support the value of outdoor educational experiences and free play for students. Malone and Tranter (2003) determined, after conducting the “Children’s Environments Project”, that children exposed to school grounds that utilized the outdoors as classrooms were successful on both a cognitive and behavioral spectrum (Malone and Tranter, 2003). Australian children are drenched in learning opportunities in the outdoors because practitioners recognize the epistemological value of nature-based education, field trips, and unstructured play in nature.

*Take Students Outside*

“Take it outside!” by Danielle Fisher (2008), describes teaching methodologies for implementing nature-based programming into traditional science classrooms. Fisher (2008) gives examples of nature-based field trips and web-based projects. In referring to examples of lessons in the outdoors and in national parks, Fisher (2008) states, “Mother Nature is the teacher of teachers, these parks the greatest schools and playgrounds. No other school is likely to inspire
children…” (p. 16). While a redundant theme within the literature review, the picture is clear. When students are brought outside and given opportunities to learn in nature, in meaningful ways, there is a benefit.

*Time Inside*

An additional study surrounding the infusion of nature into educational practices is supported by Thomas Lord’s “If You Go Down to The Woods Today” (2008). In his work, Lord relays his own childhood experiences of being outdoors as a youngster and, similar to Richard Louv, shares a wide array of problems which are attributed to the lack of nature in youngsters’ worlds today. Much of children’s time, when indoors, is spent in their bedrooms, using multiple forms of technology. Children watch television, text to friends, visit social networking sites, and surf the internet rather than going outdoors and engaging in unstructured play. In fact, nearly 99% or children live in a home with a television, 73% have a computer at home, and 49% have a video game player (The Henry J. Kaiser Family Foundation, 2003). As previously written, our society is moving indoors at a rapid pace. Lord connects the pervasive problem of ADHD to the increase in sedentary activities. Indeed, perhaps the real problem with youngsters suffering from ADHD is the lack of time spent outdoors (Lord, 2008). This literature provides additional evidence that children spend less time outdoors today than in years past.

*No Child Left Inside*

The No Child Left Inside Act of 2009 amends the Elementary and Secondary Education Act of 1965 to require states to develop environmental literacy plans for pre-kindergarten
through grade twelve inclusive of environmental education standards and teacher training (NCLICoalition.org). Current NCLB requirements of student proficiency in English language arts and mathematics at various grade levels has caused many states to disregard content areas other than those assessed. The NCLI Act serves as a reminder to all that educating youngsters should be inclusive of all content areas as well as the environment. Proponents of the act site that one of the greatest challenges facing current and future generations is that of building a sustainable and energy-efficient world. Teaching students about the role of the environment and encouraging stewardship is a hallmark of the Act. Further those supporting the passage of NCLI note that “Studies show that environmental education can help boost student achievement, build students’ critical thinking and social skills, improve student behavior, and can enhance teaching” (Committee on Education and Labor, http://edlabor.house.gov/no-child-left-inside-act/index.shtml).

The Work of Richard Louv

Author Richard Louv may be credited with the increased awareness of the need for youngsters to be outside and engaged in nature. Louv’s “Last Child in the Woods: Saving our Children from Nature-Deficit Disorder”, provides thought-provoking and undeniable information on the benefits of nature.
Summary

The work of past and present theorists and practitioners have come together in the preceding literature review and support the notion that children benefit when engaged in experiential, nature-infused learning. Noted academics such as John Dewey and Howard Gardner provide a platform by which the problem of practice has been examined. The deep review of findings from the likes of Lieberman and Hoody, Sobel, Baines and Slutsky, Olson and Clough, Ferguson, Angell, and Tudor, Manzo, Martin, Brookes, Malone, Tranter, Fisher, Lord the Federal Government, and Louv provide a deeper understanding of the benefit of outdoor, nature-based, and experiential learning opportunities for typical students. The research conducted with the BHMCS ILC students provides new information in regard to the impact such teaching practices have on low-incidence, high intensity special education students. While the benefit of receiving instruction in conjunction with the outdoors is evident in the preceding literature review on typical students, the implementation of a pilot program for BHMCS ILC provides more information on the impact for special education students. Clearly, theorists and practitioners will agree that students benefit from learning by doing, being outside, and engaging in hands-on, nature-based instruction. Research on the benefits of experiential, nature-based teaching in the outdoors on high-intensity special education students suffering from the aforementioned as well as multiple or undiagnosed disabilities has occurred with the insight of the varied theoretical frames provided and deep literature review. Because of the unique population found within the BHMCS ILC, the lessons learned from the implementation of a pilot
program will be important and offer opportunities for advanced understanding in regard to the problem of practice.
CHAPTER III

METHODOLOGY

Overview

The research methodology employed for the program evaluation was both quantitative and qualitative in methodology, also known as a mixed methods approach. The study, like solid mixed methods reviews, utilized research questions which incorporated personal purposes, practical purposes, and research purposes (Maxwell, 1996). The use of a mixed methods approach allowed for quantitative analysis of the academic and behavioral impacts of programming in addition to qualitative analysis on the social and emotional impact on students and staff when exposed to a distinctly different pedagogical practice atypical of traditional programming. Overall, the research design demonstrated validity and credibility and utilized survey instruments which, as Creswell (2009) notes, are common in quantitative and qualitative, or mixed methods.

Research Questions

The research study was formulated in such a way as to measure the impact an outdoor, nature-based, experiential educational curricula had on youngsters with significant disabilities. The research was conducted in order to answer the following questions:

1. What impact does an outdoor, nature-based, experiential program have on the academic proficiency levels of students with significant disabilities?
2. What impact does an outdoor, nature-based, and experiential education program have on the behavior of students with high intensity special education needs?

3. To what extent do students perceive the benefit (or not) of participation in “Nature, Nurture, Knowledge” on learning and behavior?

4. To what extent do staff perceive the academic benefit (or not) of teaching science and English language arts outdoors, in a nature-based and experiential way?

5. To what extent do staff perceive the behavioral benefit (or not) of teaching science and English language arts outdoors, in a nature-based and experiential way?

6. In what ways do staff differentiate (or not) the benefits between science and English language arts when taught using outdoor, nature-based, and experiential methods?

Research Procedures

Site and Demographics

BHMCS, located in Marstons Mills, Massachusetts, served as the research site. The school houses over eight-hundred and forty students and represents all of the villages of Barnstable including; Osterville, Cotuit, Marstons Mills, Hyannis (including Hyannis Port), Barnstable, West Barnstable, and Centerville. The school enrolls all fourth and fifth grade students in the Town of Barnstable. Barnstable is the largest town on Cape Cod and includes a diverse population. In 2009-2010, the Barnstable school district was comprised of the following ethnicities: 82.2% Caucasian, 5.8% Hispanic, 5.1% African American, and 4% Multi Race, Non-Hispanic students (MA DESE). In addition, Barnstable students come from a wide array of
socioeconomic levels. Through the 2009-2010 school year, 23.4% of students received free lunch and 6.9% of students received reduced lunch. Statistically, the free and reduced lunch population in Barnstable is just 3.3% lower than the state average (MA DESE). While BHMCS is classified as a Horace Mann charter school and is, therefore viewed by the MA DESE as a separate Local Education Association (LEA), for practical purposes, BHMCS students are representative of the larger Barnstable Public Schools District.

Participants

Enrollment in the BHMCS ILC is often reserved for youngsters identified with specific neurological impairment and intellectual disability. Students included are typically diagnosed with Down’s syndrome, Autism, and multiple-level impairments. Students within the ILC have specific Individual Education Plans with unique goals for academic, social, and emotional achievement. One teacher is assigned to the classroom and four paraprofessionals assist in the facilitation and delivery of instruction. The number of students enrolled in the ILC varies each year as fifth graders move on to the Barnstable Intermediate School (BIS), and newly enrolled fourth graders from corresponding K-3 programs in the district enter BHMCS. The number of students assigned to the BHMCS ILC is dynamic. Changes occur when students move in and out of the district with significant impairments. Enrollment may rise with the influx of students or drop should families move or should the school determine that staff are unable to accommodate the needs of youngsters in attendance and place youngsters in out-of-district and collaborative-model specialized facilities.
There were six students assigned to the BHMCS ILC classroom for the 2010-2011 academic year requiring five instructional staff as previously written. These students represented the most challenging of students in BHMCS and were identified as having significant disabilities. The BHMCS classroom, located on the first floor of the two story building, is large, looks like other typical classrooms in the building, and is warm and inviting to visitors. Classroom computers line a classroom wall, desks and chairs are arranged in a way which facilitates instruction, sunlight floods the room, and a “time-out” corner is non-obtrusive.

Research Staff

The classroom teacher and paraprofessional staff served as researchers within the study. Each member of the team administered science and English Language Arts lessons in the BHMCS courtyard when possible and infused nature into the established curriculum. Training on the use of PCBS forms occurred and all staff maintained personal logs, recorded student assessment data, and submitted daily progress sheets.

Single-Subject Research Design

Single-subject designs, often used in special education, are used to study the changes on subjects after being exposed to an intervention. Because of this, the research project utilized a single subject research design. Five of the six students enrolled in the BHMCS ILC served as subjects both during and absent the implementation of “Nature, Nurture, Knowledge”. Extensive data collection occurred inclusive of academic achievement scores, behavior reports, staff logs, student interviews, and staff interviews. The quantitative data, including student
academic and behavior scores, combined with the qualitative data, including teacher logs, student interview responses, and staff interview responses were recorded for each individual student participant. The material collected on each child was comprehensive, coded to ensure anonymity, and analyzed in order to draw conclusions to the research questions previously posed. While defined as a single-subject study, the research incorporated multiple subjects (students) and provided multiple data sets. While Fraenkel and Wallen (2003) note that single subject research is generally weak in regard to internal and external validity, both authors stress that action research is research which “might actually be carried out in schools” as opposed to the confines of an office (p. 569).

*B-A-B Model*

The research employed a B-A-B design as interpreted by Fraenkel and Wallen (2003). As noted by the authors, the B-A-B model is often used because an intervention may be implemented with positive results, then removed, and finally brought back which may curb unwanted behaviors (Fraenkel and Wallen, 2003). The B-A-B model fit the needs of the “Nature, Nurture, Knowledge” study as the subjects displayed the aforementioned negative behaviors as well as poor academic achievement. Fraenkel and Wallen, (2003) note that often times B-A-B designs are used when “an individual’s behavior is so severe or disturbing that a researcher cannot wait for a baseline to be established” or “when there is a lack of behavior…the subjects have never exhibited the desired behaviors in the past” (p. 312). Because of these
factors (undesirable behaviors and lack of desired behaviors in the past) the B-A-B model (intervention– baseline – intervention) was utilized.

Timeline

The B-A-B model involved the use of three time periods: a period of intervention, a period of baseline, and a final period of intervention (Fraenkel and Wallen, 2003). Specifically, students in the BHMCS ILC received outdoor, nature-based, and experiential lessons taught by a certified high intensity special education instructor and paraprofessionals over a three week time frame (“B” period). Following the three-week intervention, a three-week period absent of the intervention occurred representing the “A”, or baseline period. Finally, the intervention was reintroduced for a second three-week period, representing the final “B” period in the model.

The implementation of the study began on October 18, 2010. The study concluded on December 17, 2010. The following chart outlines the specific times by which the research project adhered:

<table>
<thead>
<tr>
<th>Intervention Dates</th>
<th>Baseline Dates</th>
<th>Intervention Dates</th>
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</thead>
<tbody>
<tr>
<td>B Period</td>
<td>A Period</td>
<td>B Period</td>
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</table>

Each period of intervention and baseline were approximately three school weeks each.
Fifteen school days of intervention were followed by fifteen days of non-intervention, and finally the study concluded with fifteen days of intervention.

Students were exposed to the teaching of the BHMCS science and English language arts curriculum in the BHMCS courtyard when practicable. Lessons were geared to be experiential, outdoors, and nature-based from October 18, 2010 to November 5, 2010. Quantitative data was collected including academic performance tests and PCBS forms. In addition, qualitative material was collected in the form of student and staff interview responses and teacher logs.

The second period of time, also known as the baseline or non-intervention period, spanned November 8, 2010 to November 23, 2010. As in the case of the intervention period, quantitative data in the form of academic performance tests, and PCBS forms were collected. Qualitative data was also gathered in the form of staff and student interview responses and teacher logs. The quantitative and qualitative data was labeled and held as part of the non-intervention or “A” period of the intervention.

Finally, the last period of intervention occurred from November 29, 2010 through December 17, 2010. Quantitative data was again collected in the form of academic performance tests and PCBS scores. Additionally, interviews with student and staff participants as well as parents and guardians created a final set of qualitative data in addition to teacher logs.

Data

Quantitative Data

Student quantitative data collected consisted of the Pupil Classroom Behavior Scale
PCBS) records. The data served as a means by which to measure student behavior and ultimately assess the benefit, or lack-of, from the prescribed treatment. The PCBS, originally developed from the eight-item “Behavior Ratings of Pupils” known as the Bower scale (Dayton, 1967), was utilized because the information gleaned and administration of the test were determined to be effective. The original Bower scale, utilizing an eight item assessment describing behaviors of emotionally disturbed children and emphasizing disruptive and anti-social behaviors, is used for clinical evaluations. The PCBS, which does include the eight original items of the Bower scale and sixteen added items result in twenty-four item scale, is designed to allow the teacher to indicate the frequency of occurrences of student behaviors based on classroom experiences and focus on behavior changes in classrooms. Each item has a five point frequency-of-occurrence continuum (almost never or never to most of the time) and covers social achievement oriented behaviors (Dayton, 1967). Scores with numerically high numbers are desirable as opposed to low or undesirable behaviors.

Qualitative Data

Qualitative data collected throughout the program evaluation consisted of student and staff responses to in-depth interview questions. Interviews were conducted three times and coincided with the conclusion of each research period (intervention, baseline, intervention). Oral interviews were conducted with student and staff participants, recorded, and served to be more expansive than a simple questionnaire, which is often considered less time intensive. Clarifying questions were posed and responses expanded as needed.
Instrumentation

Fraenkel and Wallen (2003) posit that instrumentation must be valid, reliable, objective, and usable within research. As instrumentation includes all forms of data and tools a researcher may utilize within a project, careful consideration of the problem of practice, significance of the problem, and proposed intervention, dictated the tools necessary to collect data.

PCBS

Student behaviors were tracked using the Pupil Classroom Behavior Scale (PCBS) created by C. Mitchell Dayton, Ph. D. Unlike behavioral assessments such as the BASC II which tests for behavioral and emotional issues, Connors Rating Scale which tests for and identifies ADHD, and the Vineland II which identifies developmental delays, autism, and other impairments (Pearson Corporation), the PCBS protocol is designed to be easily administered by teaching personnel. In addition, unlike many protocols and assessments which focus on student behavior and the diagnoses of behavior problems, the PCBS strives only to document, as opposed to diagnose, behaviors. The instrument was preferred because, as the author states, “the total number of items, 24, was kept small on the PCBS in order to avoid presenting the teacher with an overwhelming task” (Dayton, 1967, p. 2.). The document is inclusive of a rating system (1-5) for each of the articulated behaviors and will take approximately five minutes per student per evaluation.

Stability of PCBS Key Across Grade Levels

Dayton (1967) reported that in order to formally study the comparability of the factor
structures across the grades, canonical correlation coefficients were computed between all pairs of grades. The researchers performed multiple tests to ensure the protocol would be effective in different grade levels. Panel X (next page) from Dayton’s study represents the matrix of canonical correlations, none of which is less than .998.

<table>
<thead>
<tr>
<th>GRADE</th>
<th>3</th>
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<th>5</th>
<th>6</th>
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**Reliability of the PCBS**

Reliability refers to the consistency of the scores obtained – from one administration of an instrument to another (Fraenkel and Wallen, 2003). Rating instruments, particularly when relying on personality traits, are often seen as less reliable than standardized aptitude or achievement tests. Often times reliability is decreased when instruments have a more limited
number of items such as the PCBS. Dayton (1967) writes, “The PCBS is a pleasant exception to this rule. At all elementary grade levels, 2 through 6, split-halves reliability coefficients were in the interval from .87 to .91” (p. 19). Panel XV on the following page shows the researchers’ work on finding reliability:

**PANEL XV**

Split-Halves Reliability Coefficients of the PCBS Subscores by Grade Level - 1965-66 Samples

<table>
<thead>
<tr>
<th>Grade</th>
<th>Subscore 1</th>
<th>Subscore 2</th>
<th>Subscore 3</th>
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<tbody>
<tr>
<td>2</td>
<td>.91</td>
<td>.87</td>
<td>.87</td>
</tr>
<tr>
<td>3</td>
<td>.90</td>
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<td>6</td>
<td>.89</td>
<td>.88</td>
<td>.90</td>
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</table>

**Validity of the PCBS**

Dayton and his researchers tested the validity of the PCBS extensively. In order to establish the validity of the instrument researchers looked into four distinct areas: sex differences in PCBS sub-scores, sensitivity of PCBS sub-scores to experimental treatments,
pupils nominated to be of unusual concern, and correlations with other variables (Dayton, 1967, p. 26-27). Findings on the above questions revealed that girls generally scored higher than boys which suggests that some items are viewed as sex-related behavioral traits. Researchers further found that students deemed as a particular concern rated lower and therefore “the PCBS does successfully measure a teacher’s reactions to students along dimensions related to common concern areas” (p. 28).

Interviews

*Staff and Student Interviews*

Staff and youngsters involved in the program were interviewed in order to qualitatively define the perceptions and reflections of the subjects and practitioners. The responses to questions posed of both students and staff were recorded and analyzed. Triangulation of quantitative data derived from assessment and behavior forms and qualitative data from student and staff interviews provided a means by which comparisons were made. Interview results, which provide qualitative findings for research, relying more on words than numbers, helps to understand the value participants assign to a study (Maxwell, 1996).

*Interview Questions*

Maxwell (1996) writes, “Your research questions formulate what you want to understand; your interview questions are what you ask people in order to gain that understanding” (p. 74). The questions asked of students and staff elicited the feelings of participants as well as teaching staff.
Teaching staff were asked the following interview questions:

1. How do you feel that being inside impacted the students academically?
2. What types of academic changes occurred when the students were inside with typical instruction?
3. How do you feel that being inside impacted the students behaviorally?
4. What types of behavioral changes did you observe over the last three weeks?
5. Do you feel that one subject (science of ELA) was better suited to be an outdoors, nature-based, experiential curricula?

Students were asked the following questions:

1. Question: How did going outside help you behave?
2. Question: How did being outside help your learning?

The interview questions were designed provide insight on staff and participant perceptions. This was important as the data that surfaced allowed for a meaning to be assigned to the research study and research questions (Maxwell, 1996).

Teacher Logs

Daily journals were maintained by staff involved in the study. Teachers recorded personal observations on a daily basis and also communicated to parents and guardians via daily communication logs. The journals proved valuable in that staff thoughts and feelings were included during the intervention, absent the intervention, and finally, in the last stage of the study. In addition to staff perceptions written in the logs, direct quotes were captured from the participants and documented. Finally, the daily communication logs included staff and student
writing which was useful in the process of determining perceptions and feelings of both staff and student participants.

Triangulation

Collected responses to interview questions provided a means by which the data could be triangulated. Creswell (2009) refers to “concurrent triangulation” as the act in which the researcher collects both quantitative and qualitative data and compares the two databases to determine if there is convergences, differences, or some combination (p. 213). The data collected in the form of student GPAs, PBCS, teacher logs, student interviews responses, and staff interview responses, all combined to inform the research and provide answers to the research questions.

In order to address the overarching research questions, the report outlines quantitative data followed by qualitative data. As Creswell (2009) notes, this type of side-by-side approach is often seen in mixed methods studies and offers the reader quantitative results followed by qualitative quotes that support or refute the results.

Validity and Credibility

Validity generally denotes whether the research design truly reflects the issue being examined while reliability generally denotes whether or not the study’s findings may be generalized (Locke, Silverman, and Spirduso, 2010). The validity and credibility concerns surrounding the research included the size of the sample, the protocols utilized, and the data collection and analysis on the part of the researchers.
Sample Size

In that the BHMCS ILC enrollment for 2010-2011 was just six students, the question of whether or not the sample size was too small may surface. If the study size is deemed too small, the validity of the study may, in fact, be jeopardized. Fraenkel and Wallen (2003) note that single subject designs, are effective, valid, and credible despite the sample size.

Protocol

Science and English language arts curriculum, already in place at BHMCS, was modified for youngsters in the BHMCS ILC. The special education teacher accommodated the students and significantly modified the units of study. Lessons, whether requiring slight or significant modifications, were taught in the outdoors when possible, included elements of nature, and were experiential. All lessons were reviewed closely prior to implementation to assure that the theories of nature-based, experiential learning were truly incorporated into the instruction. The assessments and corresponding tracking forms were valid and appropriate as well as relative.

Collection of Data

Data collection was an important part of maintaining credibility in findings. Definitions of success were clearly articulated with all involved and the protocol for tracking behavior was agreed upon prior to the start of the study. All of the adults involved in tracking behaviors demonstrated a thorough understanding of how to complete forms and submit information. Scoring agreements were an important step in ensuring validity and reliability (Fraenkel and Wallen, 2003). A fair and accurate picture of student behavior was logged when students were
exposed to new pedagogical practices and nature-based curricula as well as when the students were not involved in the strategies outlined within the intervention. As Yin (2003) notes, construct validity involves identifying specific types of changes that are to be studied (academic achievement and behavior) and demonstrate that the measures reflect the specific types of changes that have been selected. Further, Yin (2003) notes that in order to demonstrate reliability, the case study, should it be replicated, should be able to be duplicated by other researchers and repeated. “Nature, Nurture, Knowledge” may be replicated at BHMCS or any other educational institution. The parameters or the study are clear and the program available for dissemination. The implementation of “Nature, Nurture, Knowledge”, therefore, meets recognized criteria for validity and reliability.

*Trustworthiness*

Lincoln and Guba posit that trustworthiness within research involves establishing credibility, transferability, dependability, and confirmability (Lincoln and Guba, 1985). The study addressed all of the aforementioned variables. Credibility was established through the long engagement of the treatment and triangulation of data. Transferability was secured in that a deep review of the problem of practice, intended treatment, and methodology was connected with similar educational scenarios in schools across the Commonwealth, throughout the United States, and internationally. Finally, confirmability was authenticated through the clear and stated role the researcher and continually noted throughout the study.
Bias

Researchers must contend with the fact that bias is inherent within research studies. As noted by Morgan (2001), single subject designs must be reproducible and therefore are less susceptible to bias. While the standards applied to single-subject design may protect against bias, there is also the possibility that the collector of data may distort data (Fraenkel and Wallen, 2003). In order to combat the likelihood of bias all procedures utilized were standardized and data collectors were trained in observation.

Scholar Practitioner / Principal

In that the study was conducted by the BHMCS Principal, the role of practitioner / scholar was identified as a potential for bias. It is understandable that a skeptical eye may suspect that the work as a researcher and principal may be in conflict. In order to combat bias, research personnel were continually briefed on the differences between the researcher as an instructional leader and the researcher as a doctoral student at Northeastern University.

The research used met the requirements of the Northeastern University Ed. D. program and was significantly different from the daily approach to entrepreneurial programming for youngsters at BHMCS. Because of this difference, and because of established trust with staff, the preconceived notions of the researcher were not imparted on the research or the staff.
Hypotheses

Hypotheses or propositions were not shared with research personnel or student participants. Data was not manipulated or limited in order to prove hypotheses and, further, multiple sources of data were included in order to study the impacts of the intervention as completely as possible. Maxwell (1996) posits that two threats to the validity of conclusions are the selection of the data that fit the researcher’s existing theory or preconceptions (p. 90). The research questions which were broad and expounded upon, provide affirmation that the research was conducted with integrity. Quantitative data (student assessments and PCBS scores) were collected by research personnel at the end of each time period. Outcomes were documented and the data was not manipulated, weighted, or otherwise changed in order to meet preconceived hypotheses.

Research Questions

Creswell (1996) posits that, in regard to interviews, research questions should not be concealed from those interviewed. In contrast to concealing research questions, when collaborating closely with an informant, it may be productive to have a sustained dialogue about the research questions (p. 75).

Teaching staff and participants were briefed on the research study interview questions prior to implementation. Teaching staff were made aware that the effectiveness of “Nature, Nurture, Knowledge” could only occur after data analysis. The students (subjects of the research) were not aware, of interview questions prior to the start of the research study. The
students (having high intensity disabilities including autism, neurological impairment, and intellectual disability) had little understanding of the research questions and propositions.

Protection of Human Subjects

The rights and welfare of all human subjects who participated in the intervention complied with all applicable state and federal laws. The researched obtained Certification of Completion from the National Institutes of Health (NIH) Office of Extramural Research and was well versed in the three principles essential to research including; respect for persons, beneficence, and justice (NIH Office of Extramural Research, accessed July, 2010).

Participants

Students in the BHMCS ILC were between the ages of nine and eleven. The youngsters involved in the intervention have disabilities which affect their ability to reason, understand complex tasks, and, at times, behave appropriately. These youngsters are the neediest of all students attending BHMCS and must be protected and all students, regardless of disability, were treated with dignity and respect and afforded the best instruction possible. Because the students are compromised physically, neurologically, developmentally, or in any other combination, the utmost in care was assured.

Students participating in the proposed intervention received instruction by a certified special education teacher. Paraprofessionals, many with a number of years experience working with high intensity special education populations, also served as instructors in the pilot program. Students received the same curricular concepts as students in typical classrooms at BHMCS with
the exception that an infusion of nature and the outdoors flavored the science and English language arts instruction. Science and English language arts were chosen to be the models of instruction out of all four content areas (mathematics, English language arts, social studies, and science) because natural connections could occur within the established BHMCS units of study. Students in the BHMCS ILC were protected subjects, as the instructional practices which were utilized in both science and English language arts are, in theory, best practices in education.

**Student Identity**

The students’ identity was not revealed at any time during the intervention and subsequent reports. While the intervention may be shared and the practice disseminated to other organizations, the students’ profiles will not be included, as that information is deemed confidential within the confines of the study. Anonymity of the subjects is a critical part of the intervention, as the sharing of personal information, including physical, neurological, psychological, or academic information of participants without permission would be unethical.

Students enrolled in the BHMCS ILC program were valued participants in the research study. Participants are not objects to be viewed, rather, they are particular people with inalienable rights that must be respected (Locke, Silverman, and Spirduso, 2010).

**Summary**

Based upon what research suggests and the theoretical lens of inquiry, a single subject research design was developed in order investigate a particular phenomenon (“Nature, Nurture, Knowledge”) and utilize real-life context (Yin, 2003). As written previously, the benefits of
outdoors, nature-based, and experiential learning are clear. The gap in knowledge remained as that of discovering what impact such programming has on a unique population such as the students assigned to the BHMCS ILC. Researchers inclusive of Blair (2009), Cachelin, Paisley and Blanchard (2009), and Caldwell, Baldwin, and Smith (2004) provide references for information regarding similar studies. Careful planning led to a comprehensive and effective research study with an effective methodological design.
CHAPTER IV
RESULTS

Overview

The research project involved the study of five student subjects. Four boys and one girl participated in the study. Rich descriptions of each child and the quantitative and qualitative results of the B, A, B time periods are provided within this “results” section of the DPR. The data included is presented in order to provide a deeper understanding of the students and the impact of each of the research project timelines. In order to ensure anonymity, student names have been withheld and data has been catalogued carefully to ensure the protection of all subjects. A thorough analysis of each time period includes the quantitative data of PCBS scores as well as qualitative data in the form of direct quotes and anecdotal observations as shared by staff through interviews, personal logs, and home-to-school communication journals. All of the data is presented in tables and Excel charts in order to provide ease in interpretation.

Presentation of Research Project

Prior to beginning the process of implementing the research project, personal meetings with me, as researcher, and stakeholders and authorities within the Barnstable Public School District were held. The meetings provided a platform by which to garner support for the undertaking. Members of the Barnstable Public Schools (BPS) Leadership Team, inclusive of the Superintendent of Schools, Special Education Director, and Pupil Personnel Director were included. All were asked to attend meetings with me to review the study. In addition to
members of the BPS Leadership Team, the Chair of the BHMCS Board, BHMCS Administrative Team, BHMCS Special Education Coordinator, and BHMCS faculty and staff involved with the BHMCS ILC were informed of the project and drawn into discussions over the methodology to be employed as well as the study timeframe. Separate meetings were scheduled with each group in order to address the complexities of the project as well as air any concerns. Overall, unanimous support emerged from all parties and the meetings and dialogue that emerged from multiple sessions was collegial, professional, and congenial. Excitement about the project emerged from the BHMCS ILC teacher all the way to the Superintendent of Schools.

The meeting occurred between the researcher and BPS Superintendent in August of 2010. The project was explained fully to the Superintendent inclusive of the research surrounding outdoor, nature-based, experiential learning. The problem of practice was discussed and validation of the need to change current practice occurred. Concerns regarding the role of NEU doctoral candidate versus BHMCS Principal were aired and discussions emerged regarding the ways in which bias would be avoided. In addition, dialogue occurred in regard to the role of supervision of staff and academic freedom. After a fully vetted presentation of the positive attributes of the project, the Superintendent gave her full approval for the study. Once approved by the Superintendent, further discussions occurred with both the BPS Special Education Director and BPS Pupil Personnel Director. Both parties were supportive of the project in light of the theories surrounding nature-based, outdoor, experiential education and the acknowledgement of the overall problem of practice.
Once the full approval of the BPS Leadership Team occurred, a separate meeting was held with the Chair of the Board of Trustees. As noted previously, BHMCS is a separate LEA and therefore the BHMCS Principal is employed by the Board of Trustees, receives employment contracts from the BHMCS BOT, and is under the direction of the BHMCS BOT as opposed to the Superintendent of Schools. In recognition of the aforementioned authority of the BHMCS BOT, it was critical to receive approval for the undertaking of the doctoral research project by the governing body of the school.

A meeting with the BHMCS BOT Chair was held in August of 2010, shortly after receiving approval to move forward with the project by the BPS Superintendent of Schools. The Chair of the Board was given information on the negative behaviors of students housed in the BHMCS ILC and a full review of the problem of practice, theoretical base for change, and literature review followed. Great detail was given to ensure an understanding for the need to implement a change in practice. Assurances were made in regard to the protection of students, staff, and families. Questions were addressed and ultimately the BOT Chair agreed to the auspices of the research project and implementation of “Nature, Nurture, Knowledge.”

The final meeting held in order to gain support for the research project occurred in September of 2010. Staff associated with the BHMCS ILC inclusive of the lead teacher and three paraprofessionals were gathered together. The BHMCS Special Education Coordinator and the two BHMCS Assistant Principals were invited to the meeting. As was the case in the previous meetings held, an overview of the problem of practice was given. Next a brief review of the
theoretical frame being applied to the research was exposed. Finally, the methodology of the project was explained, along with the need to avoid bias on the part of the researcher or corresponding staff. Ultimately, there was great excitement and anticipation for the start of the project. Teaching staff demonstrated genuine interest in the research questions and proposed intervention. Staff were alerted to the fact that the research would be utilized to drive instruction and perhaps become a “best practice” for future implementation not only at BHMCS but also district-wide.

Student 1

Student 1, a grade five male, has multiple behavioral issues. Cognitively, the student is considered average to above average in intellect. Physically, Student 1 is well, agile, and appears to be a typical grade five boy. Although extremely articulate, and able to provide varied verbal responses to questions, the student is described, per the Individual Education Plan, as having Non-Verbal Learning Disorder (NVLD). Student 1 utilizes advanced language skills and, as will be seen in direct quotes, uses advanced vocabulary and speaks in poetic ways. Youngsters with NVLD typically do not understand social situations and non-verbal communication. Student 1 also displays several characteristics of Asperger’s Syndrome. Youngsters with Asperger’s Syndrome typically do not demonstrate appropriate social skills, misunderstand social situations, and withdraw into themselves. Student 1 often displays behaviors which might be considered consistent with Autism spectrum disorders and was
previously identified as having Autism in an Individual Education Plan crafted in a previous educational setting.

Both quantitative and qualitative data were gathered on Student 1 during the B, A, and final B periods of the intervention. The data is extensive and much synthesis has been done in order to provide as much information as possible to the reader. The following paragraphs outline each of the intervention and non-intervention periods and differentiate between quantitative and qualitative data collected. The data has been expressed in such a way as to ensure that readers may not only make comparisons between subjects but also potentially replicate the entire study.

*Quantitative Data: B Period*

Student 1 participated in the “Nature, Nurture Knowledge” intervention from October 18, 2010 to November 5, 2010. Quantitative data was collected in the form of PCBS scores at the conclusion of the period. The PCBS scores, shown in Table I below, identifies the ratings Student 1 received by teaching staff after the first period of intervention.
As noted previously within this DPR, the questions posed to the instructor by the PCBS assessment regarding student behavior are intended to be self-explanatory and a means by which behaviors may be identified, not diagnosed. Table I demonstrates that Student I had mid-level results in the PCBS. The PCBS scores identified Student 1 as a youngster with an initial score of medium frequency-of-occurrence. Numerically high number scores are desirable as opposed to the lower or undesirable scores (Dayton, 1967).

**Qualitative Data: B Period**

As written previously, the B Period of the research project spanned from October 18, 2010 to November 5, 2010. Within this period, Student 1 engaged in outdoor, experiential, nature-based instruction. More specifically, Student 1 was instructed in the BHMCS Courtyard...
and the curricula was integrated into the natural setting. During the time of intervention, research personnel took copious notes inclusive of direct quotes from Student 1. The following dates and corresponding quotes found in Table II provide insight into the mind of Student 1 during the initial B Period:

Table II

<table>
<thead>
<tr>
<th>Date</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 21</td>
<td>“I love this habitat.”</td>
</tr>
<tr>
<td>October 25</td>
<td>“That wind is so corny all it does is blow my paper around.”</td>
</tr>
<tr>
<td>November 1</td>
<td>“Our school is so good to all the nature.” “It’s always serious wind when we come out here.”</td>
</tr>
</tbody>
</table>

The data presented in Table II inform the reader of the positive affect Student 1 shared during the intervention. The qualitative data, in the form of notes taken by the paraprofessional assigned to Student 1 sheds a positive light on the emotional state of Student 1 when outdoors in the BHMCS Courtyard.

Throughout the intervention, research personnel maintained personal logs in order to ensure qualitative thoughts and feelings might be gathered at the conclusion of each research project time period. Table III highlights observations about the thoughts, feelings, and behaviors of Student 1 as observed by research personnel and communicated via daily log entries and parent communication sheets.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 18</td>
<td>“We did our ELA outside in the courtyard. Nice morning!”</td>
</tr>
<tr>
<td>October 19</td>
<td>“Was biting his own hands, did get self together to work on math. In and out of time out all morning.”</td>
</tr>
<tr>
<td>October 20</td>
<td>“Worked on our spelling outside in the courtyard. What a wonderful morning [Student 1] had!”</td>
</tr>
<tr>
<td>October 26</td>
<td>“Did an amazing job in science. We went out to the courtyard to do a science activity; we worked on spelling and a paper on nouns. [Student 1] had a wonderful morning.”</td>
</tr>
<tr>
<td>October 27</td>
<td>“Had a difficult time settling into class. Making gun gestures toward teacher and was asked to leave. Came to ILC with no problems. He was asked to sit quietly to calm down. He started to become aggressive – called for help – he was escorted to Assistant Principal’s office. He continued with threats.”</td>
</tr>
</tbody>
</table>
October 29 | “Went outside to do spelling and work on nouns. Had a great morning!”

November 1 | “Went outside for spelling and nouns. Rough morning.”

November 3 | “Went outside for spelling and ELA. We are finishing up with nouns. Very nice morning!”

Table III shows a mixed array of positive and negative data in regard to the affect and behavior of Student 1 during the first intervention period. Overall, the notes provided to the researcher by the paraprofessional provided a solid lens by which observations into the impact of “Nature, Nurture, Knowledge” could be made. The positive quotes, as reported by Student 1 demonstrate a positive effect.

*Interview Data: B Period*

Student 1 was interviewed in the cafeteria during “indoor recess” with the assistance of one of the BHMCS Assistant Principals. Student 1 was inside for recess under the direct supervision of the BHMCS Assistant Principal as a consequence for kicking and threatening a staff member on the previous day. Given the fact that the student was able to attend to a task, the interview session included a second person as the expectation was that more information might be gleaned as a result.
The first question posed, *how did going outside help you behave?* was responded to by Student 1 with, “it helps get my emotions out.” With further prompts, Student 1 continued with “I can’t be cramped up in this room…there’s a whole world out there!” The second question, *how did being outside help your learning?* was answered by Student 1 with, “it helps a little”. When prompted to explain more, Student 1 utilized flowery language and reported that being outside seemed to help but then added, “The casualties of the wind blows away my work. I need a clipboard or a rock or something.” In closing out the interview with a prompt about overall feelings of being in the outdoors, Student 1 responded with, “I have more space to run around and play and do stuff.” Overall, the interview with Student 1 provided a means by which the researcher could assess the impact (or lack of) the intervention had on the student. The data collected show that the intervention, as reported by Student 1, did indeed impact the student.

*Staff Interview Data:  B Period*

The staff member directly responsible for Student 1 was interviewed in the classroom away from several students who were present, yet working on a project in a separate area of the room. The following narrative outlines the questions utilized and responses elicited. Question: *How do you feel that “Nature, Nurture, Knowledge” impacted the students academically?* The staff member shared, “I think it made them focus a little bit more because it was chilly. The environment was quieter than in the classroom. The student could focus more because of the peaceful aspect of the courtyard”. Question: *What types of academic changes occurred when the students were outside, in nature, and having experiential lessons?* The staff member
responded with “[Student 1] got very competitive if [Student 2] got done first”. Question: *How do you feel that “Nature, Nurture, Knowledge” impacted the students behaviorally?* The staff member responded with “[Student 1] looked forward to the fact that at 11:15 he knew he was going out. He knew the routine and he liked it. He actually ‘got his act together’ because of the opportunity.” Question: *What types of behavioral changes did you observe when students participated in the program?* The staff member responded with, “I found that prior to going outside he would be grumpy. Once we got outside he would be in his element and became happier. I think it was good because it carried on once we came back inside. I think it really helped.” Question: *Do you feel that one subject (science or ELA) was better suited to be an outdoors, nature-based, experiential curricula?* The staff member responded with, “for me it was better to do the ELA outside. The ELA specifically, spelling, writing, nouns, they could go outside and would bring back something representative.” The staff interview responses provided meaningful information which was collated in order to provide detail into the impact of “Nature, Nurture, Knowledge” within the BHMCS ILC.

**Quantitative Data: A Period**

Quantitative data was collected on Student 1 during the “A” period of the research project. This period, November 9, 2010 to November 23, 2010 served as a period of time in which the intervention was withheld. Data from the PCBS assessment, as completed by teaching staff, is noted in Table IV.
Teaching staff completed the PCBS on Student 1 on November 23, 2010. The scores are reflective of the teaching staff’s perception of Student 1’s behavior while indoors, engaged in typical instruction, and removed from the auspices of an outdoor, nature-infused, experiential program. Again, as noted previously, higher scores on the PCBS demonstrate higher frequency of the action, behavior, or affect. In looking at the results, negative behaviors were more pronounced and positive behaviors less frequent.

**Qualitative Data: A Period**

As in the case during the B Period of intervention, research personnel documented personal observations and recorded comments which might allow for insight into the feelings, thoughts, and behaviors of Student 1. As written previously, the A Period of the intervention
occurred between November 9, 2010 and November 23, 2010. Table V provides the reader with observations as noted by research personnel in the form of daily entries in the daily communication sheet to home:

Table V

<table>
<thead>
<tr>
<th>Date</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 8</td>
<td>“Had a small issue with another student. Nice morning.”</td>
</tr>
<tr>
<td>November 9</td>
<td>“[Student 1] had a great morning. Earned playing with Legos. He was so happy today!”</td>
</tr>
<tr>
<td>November 18</td>
<td>“Worked on a Thanksgiving word search. Reviewed word problems. Lunch with Assistant Principal (for behavior yesterday). Went to gym. Did a fantastic job. Earned playing with Lego’s.”</td>
</tr>
<tr>
<td>November 22</td>
<td>“Had an okay lunch. [Student 1] did have to have a small timeout after recess for a comment he made to another student. Did timeout and continued on with the rest of the day.”</td>
</tr>
</tbody>
</table>
Data presented in Table V sheds both a positive and negative light on the behavior of Student 1 despite the hiatus in intervention. In some cases, Student 1 displayed age appropriate behaviors during the school day while at other times received disciplinary action for inappropriate transgressions.

*Interview Data: A Period*

Student 1 was interviewed in the BHMCS ILC classroom. The interview was short, as Student 1 was not cooperative. Question: *How did staying inside over the last three weeks help you behave?* Student 1 responded with, “stayed the same – all systems are practically normal.” No response was given for the second question, “*how did staying inside over the last three weeks help your learning?*” Unlike the data collected during the B Period student interview, the A Period interview of Student 1 was difficult. The responses Student 1 offered to the prompts shed little light on the impact of the hiatus. It is; however, the way in which the student responded that allows for interpretation of the data. Student 1 demonstrated negativity during the interview session in stark contrast to the verbose nature of the first interview.

*Staff Interview Data: A Period*

Just as the case after the first period of intervention, the staff member who worked directly with Student 1 over the three week A Period timeframe was interviewed. Several students were present and busy with academic work in a different area within the classroom. The interview occurred in the BHMCS ILC classroom in a quiet area so as to maintain privacy. The following outlines questions posed and responses. Question: *How do you feel that being*
inside impacted the students academically? “[Student 1] has been horrible. There were days I was here and he was awful. The true test will be on Monday. I think getting out of this room will help. I might be still outside in February when the study is over!” The staff member in essence shared with the interviewer that the three weeks indoors was quite difficult. In a playful response, with the statement “I might still be outside in February…” was meant to help the interviewer understand the clear benefit seen when Student 1 was outdoors. With the project scheduled to conclude in December, the staff member was, in essence, sharing the fact that she would prefer to be outdoors with Student 1 regardless of the requirements of the study methodology. The next question asked: What types of behavioral changes did you observe over the last three weeks? elicited another honest response. The staff member shared that the behavior of Student 1 had been poor. “Agitation, aggressive, verbally abusive, suspended. Across the board – if he has a bad morning it affects the whole day.” Information from the staff member in regard to Student 1 during the period of hiatus was most helpful. The paraprofessional was able to provide an honest account of the negative behaviors which occurred when Student 1 was taught in tradition ways in the traditional classroom.

**Quantitative Data: B Period**

The final stage of the intervention occurred during the second “B” period spanning from November 29, 2010 to December 17, 2010. With the conclusion of the intervention, staff were again asked to complete the PCBS Form for Student 1. Table VI outlines scores as expressed on December 17, 2010.
As in the case of the two previous data collection periods, teaching staff were asked to complete the PCBS on Student 1. The data provided insight into behavioral changes seen in Student I during the final stage of the research project.

Table VII below collates all three PCBS scores into one document. The reader is able to visually ascertain any differences in the three collection periods.
Table VII

The Excel spreadsheet data found in Table VII reveals the inconsistencies in PCBS scores in some indicators as noted by staff working with Student 1 throughout the research period. In several instances the scores remain static over the three points of collection while in others poor behaviors decrease or increase.

**Qualitative Data: B Period**

The final stage of the research project (November 29, 2010 through December 17, 2010) provided a final set of qualitative data on feelings and behavior. Once again, research personnel tracked and logged perceived student feelings and behaviors.
Interesting commentary which was gleaned during the final intervention through the research personnel’s personal log is articulated in Table VIII below:

Table VIII

<table>
<thead>
<tr>
<th>Date</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“We’re back in the habitat!”</td>
</tr>
<tr>
<td>December 1</td>
<td>“It would be so much easier if we did this inside. I’m freezing. It is December first you know.”</td>
</tr>
<tr>
<td>December 3</td>
<td>“It’s not so bad here today.”</td>
</tr>
<tr>
<td>December 8</td>
<td>“It’s freezing. I would like to finish inside.”</td>
</tr>
<tr>
<td>December 14</td>
<td>“I don’t want to go. It’s cold out. The only energy I want is heat. Even this paper feels like a refrigerator. At recess it’s warm because I run around. It’s too cold to work.”</td>
</tr>
</tbody>
</table>

Direct quotes noted in Table VIII reflect the students’ perception of weather rather than the environment. Although the comments are based upon the weather, the reality is that maladjusted behaviors were not noted within the time period.

In addition to the research personnel’s personal log book, quotes were taken from the log entries as noted in parent communication sheets. Thoughts, feelings, and behaviors of Student 1, as observed by research personnel, are noted in Table IX.
<table>
<thead>
<tr>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“Had to be spoken to many times during Speech for being extremely rude.”</td>
</tr>
<tr>
<td>November 30</td>
<td>“We went outside for our spelling and parts of speech. Nice morning!”</td>
</tr>
<tr>
<td>December 1</td>
<td>“Very sleepy today. Spoken to about touching other kids and he wouldn’t stop. Went outside. [Student 1] pulled together and did a great job.”</td>
</tr>
<tr>
<td>December 2</td>
<td>“Very negative this morning. Did get very rude while with [another teacher].”</td>
</tr>
<tr>
<td>December 3</td>
<td>“Great day. Attitude was great and work was great. Super morning!”</td>
</tr>
<tr>
<td>December 8</td>
<td>“Loved looking at his new book! Played zylophone, went in early from recess – was cold.”</td>
</tr>
<tr>
<td>December 13</td>
<td>“Upset / grumpy. Tried going to homeroom. [Student 1] kept saying how much hated school, hated teachers. Stated never working – had to be sent home.”</td>
</tr>
</tbody>
</table>
Data collected and articulated within Table IX allow for a mixed interpretation of results. The paraprofessional’s log entries reveal both positive and negative reports on the part of Student 1 during the final phase of intervention.

Interview Data:  B Period

With the conclusion of the second intervention period, and culmination of the research project, Student 1 was prepared for interviewing. Due to a variety of circumstance, one of which being that the student was suspended out of school, interviews did not occur. Violent behaviors demonstrated by Student 1 resulted in a suspension from school prior to Winter Recess. Unfortunately, the interviews were not completed upon his return to school.

Staff Interview Data:  B Period

The teaching staff who worked most closely with Student 1 over the final B Period of the project was interviewed in order to ascertain a perspective on “Nature, Nurture, Knowledge”.

The questions posed and answers follow. When asked how do you feel that being outside impacted Student 1 academically? the instructor replied with many positive remarks. The teacher shared that being outside “worked fantastic” and continued with, “change and not being stuck in the classroom all day is helpful to a kid like that.” Further, the instructor shared that a program, such as what had been established, should be permanently built into the child’s schedule. The second question, what types of academic changes occurred when the student were outside? prompted further reflection. The instructor shared that Student 1’s focus was impacted and stated, “he loves being outside and he would find stuff outside that related to what we were
doing – even when not asked.” When asked about how the instructor felt Student 1’s behavior was impacted by being outside, the instructor, again, responded with positive feelings and thoughts. Specifically, the instructor stated “his behavior changed for the better.” Finally, the instructor felt as though despite two or three difficult days, the act of going outdoors, utilizing experiential learning opportunities, and infusing nature was beneficial. Lastly, the instructor felt as though science was better suited to “Nature, Nurture, Knowledge” over English language arts.

Student 2

Student 2, a grade five female, does not suffer behavioral issues. Rather, Student 2 is cognitively impaired and has been diagnosed with Down’s syndrome. Physically, Student 2 is well, requires physical and occupational therapy, and presents as a happy fifth grader at BHMCS. In several respects, Student 2 does not fit the expected profile of a youngster typically placed in the BHMCS ILC. Student 2 does not display tantrums, oppositional behavior, or aggression. Through the work of this research project it was, in fact, determined that the student might be better served in the Intense Resource Room, a classroom which provides services for low-functioning students with few behavioral problems.

Both quantitative and qualitative data were gathered on Student 2 during the B, A, and final B periods of the research project. The data provide insight into whether or not the implementation of “Nature, Nurture, Knowledge” had an impact on Student 2. The following pages review data collected throughout each of the time periods, inclusive of the first intervention, absence of intervention, and final intervention.
Quantitative Data: B Period

Student 2 participated in the “Nature, Nurture, Knowledge” intervention from October 18, 2010 to November 5, 2010. Quantitative data shown below, in Table IX, show the PCBS score at the conclusion of the initial B Period. As noted on the scores, Student 2 displayed a number of positive behavioral scores, in contrast to other participants in the study.

Table IX

Table IX represents the assessment made by the instructor who worked most closely with Student 2 throughout the intervention. The scores are favorable toward Student 2 and demonstrate positive behaviors and affect. Student 2, as articulated previously, did not display many of the negative behaviors associated with students typically placed in the BHMCS ILC.
**Qualitative Data: B Period**

The B Period of the research project, also viewed as the time when the intervention was applied, provided students and staff a period to be outside, engage in experiential learning, and incorporate facets of nature into instruction. Student 2, working with a paraprofessional, often was engaged in the instruction along with Student 1. Although the two students were combined for instruction, both display vastly different intellectual abilities and behavioral controls. Despite the differences, a wealth of data was collected on Student 2 and provides a way in which to measure and assess the feelings of the participant. Table X provides the reader direct quotes from Student 2 as taken by research personnel.

**Table X**

<table>
<thead>
<tr>
<th>Date</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 20</td>
<td>“I love it out here.”</td>
</tr>
<tr>
<td>November 2</td>
<td>“I’m so freezing.”</td>
</tr>
<tr>
<td>November 3</td>
<td>“I’m glad I have my winter hat and scarf.”</td>
</tr>
</tbody>
</table>

Although simplistic, Student 2 did express some level of satisfaction in undertaking instruction while in the BHMCS Courtyard and did articulate, in some ways, enjoyment. The personal log entries made by staff display more positive feelings than the noted by Student 2 quotes.

Table XI identifies messages written into daily parent communication sheets by staff. The communication sheets serve as a conduit for communication between home and school. Teaching assistants, and in particular those who worked most closely with Student 2 routinely
write daily observations, notes, and information on the log pages. The information gleaned from the logs offer further qualitative data in order to evaluate “Nature, Nurture, Knowledge.”

Table XI

<table>
<thead>
<tr>
<th>Date</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 18</td>
<td>“Sleepy and happy, did ELA out in the Courtyard. Great morning.”</td>
</tr>
<tr>
<td>October 21</td>
<td>“Making an animal book and researching habitat. [Student 2] picked owls. Wonderful morning.”</td>
</tr>
<tr>
<td>October 26</td>
<td>“We went outside to do a science activity on day and night. We worked on spelling and a paper on nouns. Great morning.”</td>
</tr>
<tr>
<td>October 28</td>
<td>“Very happy. [Student 2] is doing an amazing job with owl book. Great morning!”</td>
</tr>
<tr>
<td>November 1</td>
<td>“Went outside for spelling and noun work. Great Monday morning!”</td>
</tr>
<tr>
<td>November 3</td>
<td>“Outside for spelling. Nice morning.”</td>
</tr>
</tbody>
</table>

The data which was provided through school-to-home communication in Table XI is overwhelmingly positive. Little can be taken from the quotes which would lead a reader to believe the intervention had a negative impact on Student 2.
Interview Data:  B Period

Student 2 was interviewed in the BHMCS ILC classroom. In order to relax the student and ease anxiety, the interview was conducted with the cooperation of the lead ILC instructor. In addition, the interviewee and interviewers enjoyed a cup of hot chocolate to lessen tension. Student 2 was told that she would be asked her thoughts on the “Nature Nurture, Knowledge” program and, more specifically, her feelings about going outside. “Do you think being outside helped you learn?” was the first question posed. Student 2 responded with, “Umm, yeah.” In order to gain more information and a richer response, the question was restated in several ways at which point Student 2 added, “I learned how to write better outside.” From that statement a discussion on whether or not a great horned owl might live in the BHMCS Courtyard ensued showing a link between subject matter and content knowledge and being outdoors. Although Student 2 is well behaved and compliant, when prompted to comment on how being outside impacted her behaviors, Student 2 responded by stating “I’m a happy girl” and “everyday I feel happy”. These responses led into further discussion. Student 2 was asked whether or not being outside impacted her happiness level. Student 2 responded by stating “outside in the cool air makes me happy” yet she also stated that she would choose to be indoors if it were too hot outside.

Staff Interview Data:  B Period

The staff member working closely with Student 2 was interviewed in the BHMCS ILC classroom in order to gather qualitative data. The following narrative details the questions and
responses generated through the interview process. Question: *How do you feel that “Nature, Nurture, Knowledge” impacted the student academically?* The staff member shared that the student seemed to focus more in the BHMCS Courtyard. The staff member felt as though the BHMCS Courtyard was more tranquil and quiet than the indoor classroom. The second question, *How do you feel that “Nature, Nurture, Knowledge” impacted the student behaviorally?* elicited the following statement by the staff member, “[Student 2] is always on her best behavior”.

Further questions posed to the instructor revolved around the idea that perhaps Student 2 simply did not display the maladjusted behaviors that other students enrolled in the BHMCS ILC exhibited. In fact, in terms of changing behaviors, Student 2 did not appear to be behaviorally impacted by the intervention. As stated by the staff member, “for someone like [Student 2] there was not as much benefit” when comparing the behaviors of challenging youngsters. Finally, the interviewee shared that the teaching of science and English language arts outdoors was beneficial and one did not take priority over the other.

*Quantitative Data: A Period*

As written previously, and articulated throughout this report, the A Period (non-intervention) of the research project spanned from November 9, 2010 through November 23, 2010. Within this timeframe, the intervention was withheld. Data collected on Student 2, via the PCBS assessment as completed by teaching staff, are shown in Table XII.
Table XII shows Student 2 behavioral ratings at the conclusion of the A Period. When compared to the same assessment following the initial B Period, one may conclude there was little difference, behaviorally, between the two timeframes. The analysis of scores, along with the feedback received through interviews, lends creditability to the case stated that Student 2 had little change in behavior or affect without the intervention.

Qualitative Data: A Period

Qualitative data was collected via daily communication entries between teaching staff and home as well as the personal log books of staff. Table XIII provides insight into the behaviors and demeanor of Student 2 as witnessed by staff and communicated to parents and family throughout the period of non-intervention.
Table XIII

<table>
<thead>
<tr>
<th>Date</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 9</td>
<td>“Worked on math, spelling, and parts of speech. [Student 2] had a very good morning.”</td>
</tr>
<tr>
<td>November 10</td>
<td>“Went to science today. We reviewed unit test on the solar system. Great morning.”</td>
</tr>
<tr>
<td>November 18</td>
<td>“Worked on creating a book about her owl.”</td>
</tr>
<tr>
<td>November 23</td>
<td>“Attended homeroom for attendance and lunch count. Down to room 125 for speech, break time, made hearts. She is a delight!”</td>
</tr>
</tbody>
</table>

As was the case with previous data, the information in Table XIII yields little insight into practical changes in Student 2’s behavior or affect. Indeed, the data collected on Student 2 via daily communication logs absent the intervention is similar to the data collected during the intervention.

Interview Data: A Period

Student 2 was interviewed in the BHMCS ILC classroom. The interview was brief and elicited little feedback. Given the fact that Student 2’s behavior had been optimal, the first question, How did staying inside over the last three weeks help you behave? revealed little insight into how the intervention might change maladjusted behavior. Student 2, as recorded, did not have contentious behaviors. Student 2 was next asked to speak about her experience learning
inside as opposed to outside. Student 2, despite her disabilities, was able to articulate the following, “I wished we could go outside because it was nice fresh air. The work inside is easy.”

Staff Interview Data: A Period

The staff member working most closely with Student 2 was interviewed following the period of non-intervention in order to gather further qualitative data. As was the case with the student interview, little information was elicited to form a conclusive opinion in which a claim that being indoors made an impact on behavior might occur. The first question, How do you feel that being inside impacted the student academically? and the second question, What types of behavioral changes did you observe over the last three weeks? were both responded to with the same type of response. In essence, the staff member reported that Student 2 did not display a difference in behaviors when inside, absent the intervention, and made the point that Student 2’s behavior was exemplary. As written previously, Student 2 did not show the maladjusted behaviors which are typically seen by students in the BHMCS ILC.

Quantitative Data: B Period

Student 2 engaged in the final B Period of the intervention from November 29, 2010 to December 17, 2010. With the conclusion of the intervention, the staff member working most closely with Student 2 was asked to complete the PCBS Form.
The following graph in Table XIV represents Student 2 scores:

**Table XIV**

As seen in Table XIV, little change occurred in PCBS scores throughout the research project for Student 2. The data provides insight into the fact that Student 2’s behavior was not significantly impacted either during or absent the intervention of “Nature, Nurture, Knowledge.”

Table XV below combines the three PCBS scores for Student 2 into one graphic. The reader, when looking at the bar graph, will see that many of the PCBS indicators remained exactly the same when looking at the three periods of “Nature, Nurture, Knowledge.”
### Qualitative Data: B Period

The final stage of the research project provided the opportunity to collect data on the feelings and behaviors (as elicited from interviews) of Student 2.
Reflective comments gathered from the teacher to home log are posted in Table XVI below:

Table XVI

<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 6</td>
<td>“Paper on nutrition for health and spent time outside on science. Very good mood / demeanor.”</td>
</tr>
<tr>
<td>December 8</td>
<td>“Morning math and writing prompt. Played with small soccer ball and had two other girls join – danced around to stay warm.”</td>
</tr>
<tr>
<td>December 13</td>
<td>“Indoors – too cold per Main Office.”</td>
</tr>
<tr>
<td>December 17</td>
<td>“Went outside for science. Read about energy. Good mood / demeanor.”</td>
</tr>
</tbody>
</table>

As was the case with the PCBS scores, Student 2 did not show any marked changes in behavior or affect from the period of initial intervention through non-intervention to final institution of “Nature, Nurture, Knowledge”. In addition to the school to home communication log, teaching staff maintained a private journal whereby observations of Student 2 might be logged and noted for use in the research project. Table XVII represents commentary staff felt were insightful.
Table XVII

<table>
<thead>
<tr>
<th>Date</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“It’s cold out here, but I have my Uggs on so I’m okay.”</td>
</tr>
<tr>
<td>December 2</td>
<td>“Student 1 refused to go outside – Student 2 prevented from going out.”</td>
</tr>
<tr>
<td>December 6</td>
<td>“Went outside for science review.”</td>
</tr>
<tr>
<td>December 8</td>
<td>“Science test completed outside – very cold.”</td>
</tr>
<tr>
<td>December 15</td>
<td>“Too cold – even had indoor recess.”</td>
</tr>
<tr>
<td>December 16</td>
<td>“Went outside for science and ‘what is energy’ reading.”</td>
</tr>
</tbody>
</table>

The direct quotes and anecdotal information taken from the personal log entries of the teaching staff working most closely with Student 2 document instances of going outdoors and the impact teaching which was experiential, nature-based, and outside had on Student 2s. In addition, the quote from Student 2 provide evidence of a calm and gentle demeanor when referencing the weather. Overall, the data collected when Student 2 was engaged in “Nature, Nurture, Knowledge” shows little evidence of significant impact on behavior.

*Interview Data: B Period*

Student 2 was interviewed by staff in the BHMCS ILC classroom. When asked, “How did going outside over the last three weeks help you behave?” Student 2 responded with, “I
always behave in school.” This, in effect, summed up the question of whether or not “Nature, Nurture, Knowledge” had a behavioral impact on Student 2’s behavior. When questioned about how participating in “Nature, Nurture, Knowledge” over the last three weeks helped in learning, the student responded with, “It feels great. Nice and cool.” With further prompts Student 2 continued with, “When I get a cold like I’m having, my dad said I can’t go outside cause I have a bad cold.” Overall, the interview of the student and results of the intervention were positive in terms of eliciting feedback to the project.

*Staff Interview Data: B Period*

Due to a variety of circumstances, several staff worked with Student 2 during the final B Period of the research project as opposed to one specific staff member. Unfortunately, the staff members who worked with Student 2 over the final three weeks were not available for interview as many were substitutes and did not have repeated sessions at BHMCS. In order to avoid questions of validity and proper protocol, substitute teachers were not interviewed at the conclusion of the B Period.

*Student 3*

Student 3, a grade four male, suffers from autism and developmental delay. Cognitively, the student is considered below average. The student is overweight and requires personal hygiene attention. Independent toileting on the part of the student is not possible and he is learning to attend school without a diaper. The student displays poor social skills inclusive of non-verbalization at times, whispering at other times, and running away / fleeing when unsure or
scared of situations. The student receives support from a paraprofessional throughout the day and responds well to individualized attention. The paraprofessional assigned to Student 3 supports a second child from the BHMCS ILC and therefore Student 3 receives individualized instruction and support alongside another youngster.

Quantitative and qualitative data were gathered on Student 3 during the B, A, and final B periods of the research project. The data is provided in the following pages and includes the periods of time from the implementation, subsequent removal, and final implementation of “Nature, Nurture, Knowledge.”

**Quantitative Data: B Period**

Student 3 participated in outdoor, experiential, nature-based intervention from October 18, 2010 through November 5, 2010. The student was opposed to going outdoors and verbally shared his fears about going into the BHMCS Courtyard. Paraprofessional and teaching staff worked to bring Student 3 outdoors in order to participate in the research project. Several attempts at going outdoors were abandoned due to the need to maintain order and avoid fleeing behaviors. The staff member who worked most closely with Student 3 willingly participated in the research and filled out the PCBS at the conclusion of the first period of intervention.
Table XVIII shows the PCBS scores for Student 3 below:

Table XVIII

<table>
<thead>
<tr>
<th>11/5/2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

Table XVIII shows provides information on the range of positive and negative behavior and personal affect shown by Student 3 at the conclusion of the B Period. Social interactions ranging from commenting on others work is low while cooperation rates are high. The value of the PCBS scores shown in Table XVIII is that the wide range of ability is demonstrated.

**Qualitative Data: B Period**

During the initial intervention period, Student 3 was prompted to go outside in order to engage in outdoor, experiential, and nature-based instruction. As written previously, Student 3 was not readily amenable to a change in environment and did not respond well to being
instructed in new or different ways and locations. Teaching staff, excited to engage in the research project, continually worked to integrate Student 3 into the program. Table XIX below provides insight into the endeavor through the personal log entries of the teacher who worked most closely with Student 3.

Table XIX

<table>
<thead>
<tr>
<th>Date</th>
<th>Log Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 18</td>
<td>“[Student 3] refused to go outside – bolted down hall.”</td>
</tr>
<tr>
<td>October 19</td>
<td>“Attempted to do science in Courtyard. He walked around a bit, looking at the pond and some rocks I pointed out, but would not read about rocks. Ran into building.”</td>
</tr>
<tr>
<td>October 20</td>
<td>“[Student 3] said he was afraid of rocks – never made it outside.”</td>
</tr>
<tr>
<td>October 22</td>
<td>“I read a chapter of Rocks, Gems, and Minerals to [Student 3] in Courtyard. Did not show much interest.”</td>
</tr>
<tr>
<td>October 26</td>
<td>“[Student 3] read about some science in Courtyard. Not really interested. Attention elsewhere.”</td>
</tr>
</tbody>
</table>
Table XIX reflects the progression of Student 3’s willingness to go outdoors over the three weeks of intervention. The log entries clearly evidence the efforts put forth to include Student 3 in the intervention and the effect on the student. As noted in the writings, Student 3 moved from complete refusal to short statements about being outdoors. Thus, Student 3 was able to participate in the research project intervention through the support of teaching personnel. Overall, Student 3 demonstrated an improvement of social interactions when exposed to “Nature, Nurture, Knowledge”.

In addition to the personal logs of teaching personnel, a daily communication log was sent to Student 3’s home. Notes and comments articulated on communications to home during the intervention period provide a way in which to ascertain the impact of “Nature, Nurture,
Knowledge” on Student 3. Table XX contains quotes as taken from the school to parent/home log.

Table XX

<table>
<thead>
<tr>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 18</td>
<td>“Bolted down hall when asked to do paper in Courtyard.”</td>
</tr>
<tr>
<td>October 19</td>
<td>“Would not read the ‘Rocks’ packet outside.”</td>
</tr>
<tr>
<td>October 20</td>
<td>“[Student 3] said he was afraid of rocks and would not watch [video] or go outside for lesson on rocks.”</td>
</tr>
<tr>
<td>October 22</td>
<td>“Science in Courtyard – rocks, gems, and minerals.”</td>
</tr>
<tr>
<td>October 26</td>
<td>“Read some science in Courtyard.”</td>
</tr>
<tr>
<td>October 28</td>
<td>“Read book on idioms out in Courtyard.”</td>
</tr>
<tr>
<td>November 1</td>
<td>“Went over and wrote spelling words in Courtyard.”</td>
</tr>
<tr>
<td>November 2</td>
<td>“Went outside for spelling. Seemed to enjoy it!”</td>
</tr>
</tbody>
</table>

The comments provided in the school to home log indicate that as time proceeded, Student 3 accepted the infusion of outdoors into instruction. Notes provided over the course of the
intervention period, as written by teaching staff to home, provide data which supports the willingness of Student 3 to participate. Indeed, the anecdotal data provides a sense that at some level, Student 3 enjoyed the experience.

Interview Data: B Period

At the conclusion of the first period of intervention, Student 3 was interviewed. In order to elicit deep responses, the interview was conducted in the presence of the BHMCS ILC teacher. When asked if Student 3 would answer a few questions he responded with, “no thank you.” Ultimately, through careful crafting and reassurance, interview questions were asked and responses were gathered. The first question, How did going outside help you learn?” was responded with a high-pitched voice. A whisper of “yes” followed. Unfortunately, Student 3 appeared to be in agreement with any prompt given. For example, when asked if he liked going outside he responded with a yes as well as when he was asked if he liked staying inside. The interview continued and attempts were made to elicit Student 3’s thoughts on his own academics and behavior. Student 3 ultimately reported that he “likes going outside in the courtyard – liked it. It was great.” Of most interest remains the fact that Student 3 began as an unwilling participant in the first few sessions and by the conclusion of the intervention, enjoyed the new model of instruction.

Staff Interview Data: B Period

The staff member charged with working most closely with Student 3 was interviewed at the conclusion of the first intervention period. The following narrative outlines the questions
asked and responses generated. Question: *How do you feel that “Nature, Nurture, Knowledge” impacted Student 3 academically?* The staff member responded that the student was different than the other students she had worked with outdoors. Speaking candidly, the staff member felt that the true challenge was to get Student 3 outside and that academically, there did not seem to be a noticeable difference. As stated by the interviewee, “He was very pleasant but academically I can’t see there was much. I’m not sure he did better academically outside than inside.” The second question, *How do you feel that “Nature, Nurture, Knowledge” impacted Student 3 behaviorally?* was responded with by a statement in which it was articulated that there was a noticeable change. According to the instructor, going outdoors was a negative influence on Student 3’s behavior. Specifically, the instructor stated, “He bolted and didn’t want to go out. Another time he just wouldn’t do his work. The paraprofessional referenced one incident in which Student 3 stated, “No – I’m afraid of rocks…” The instructor felt that perhaps science would be a better subject suited for the program; however, the response was ambivalent. Ultimately, when asked for an opinion, the instructor stated, “It was a positive experience for [Student 5] and not so much for [Student 3]. I don’t think being outside was the problem for Student 3; rather it was a change in his routine. He did claim he was afraid of rocks but I don’t think it was really that.”

**Quantitative Data: A Period**

Following the first intervention period, a period of non-intervention occurred. Quantitative as well as qualitative data were collected in order to attempt comparisons and add to
the level of information for the research project. The primary quantitative data set surrounding Student 3 for the A Period of the research project, as with all subjects, was the PCBS assessment. Table XXI reflects the scores on the PCBS for the A Period (second time period) of the research project.

Table XXI

<table>
<thead>
<tr>
<th>PCBS Assessment</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attentive</td>
<td>3</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>4</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>2</td>
</tr>
<tr>
<td>Shows concern</td>
<td>3</td>
</tr>
</tbody>
</table>

The results of the PCBS of November 23 show very little change from November 5, 2010. As a result, it is difficult to ascertain any notable difference in behavior or self reflection using the two sources of data.

**Qualitative Data: A Period**

The same protocol for collecting qualitative data during the A Period occurred as in the case during the B Period of intervention. Research personnel documented personal observations...
and recorded comments during the period of non intervention. These observations, and notes, as noted in Table XXII, provide information on the behaviors and feelings of Student 3 as witnessed and interpreted by the observer.

Table XXII

<table>
<thead>
<tr>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 8</td>
<td>“[Student 3] never mentioned going out into the courtyard – could be because of the rain.”</td>
</tr>
<tr>
<td>November 10</td>
<td>“Read story and answered questions. Did not ask about outside. Also worked on science which is what he has done in the courtyard before.”</td>
</tr>
<tr>
<td>November 17</td>
<td>“Never mentioned going into Courtyard.”</td>
</tr>
</tbody>
</table>

The data collected in Table XXII show that Student 3 did not ask or question the teaching methodologies used during the period of non-intervention. Staff working closely with Student 3 did not record any instances when Student 3 asked about going to the BHMCS Courtyard of experiencing nature-based, outdoor, experiential learning opportunities.

In addition to the personal notes taken from the teacher log, daily school to home communication logs were collected for use as qualitative data and later interpretation.
Table XXIII provides more insight into the ways in which Student 3 responded during the non-intervention period of “Nature, Nurture, Knowledge.”

Table XXIII

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 9</td>
<td>“Good job in speech. [Student 3] would not participate in any of the activities in gym today.”</td>
</tr>
<tr>
<td>November 10</td>
<td>“Did well at morning meeting and read aloud. First part of music went well, but half way through when a video was about to be played, [Student 3] ran from room.”</td>
</tr>
<tr>
<td>November 16</td>
<td>“A bit agitated at beginning lunch – did not want to go outside for recess.”</td>
</tr>
<tr>
<td>November 17</td>
<td>“In music [Student 3] bolted from room when a Strauss video was about to be played. Became upset and bolted when room needed to be cleared to tend to another student. Once again [Student 3] bolted leaving cafeteria – just dropped coat, hat, lunchbox, and ran.”</td>
</tr>
</tbody>
</table>
November 23

“A bit distracted today. [Student 3] would not eat either the pizza or his lunch from home. He did drink his milk. Walked around at recess.”

Table XVIII contains information shared with Student 3’s parents during the period of non-intervention. The accounting of Student 3’s affect and behavior is less positive than previously documented during the period of intervention leading the observer to note the benefit of intervention on Student 3.

*Interview Data: A Period*

Student 3 was interviewed in the classroom in order to ascertain feelings and perceptions of working indoors and without the infusion of “Nature, Nurture, Knowledge.” Unfortunately, as was the case with the first series of interviews on November 5, Student 3 offered very little insight into his personal thoughts, feelings, and perceptions. When asked how staying inside over the last three weeks helped or hindered Student 3’s academics and behavior, a nonsensical response was given. Student 3 stated, “Doing fine - want to go outside – no thank you”. Further prompts for information or insight yielded little which is characteristic of Student 3.

*Staff Interview Data: A Period*

The staff member who most closely worked with Student 3 was asked to participate in an interview session. The staff member was able to share their thoughts and feelings about the
period of non-intervention. Specifically, when asked about what, if any behavioral changes were seen in Student 3 over the previous three weeks, the staff member stated that Student 3 seemed to be “bolting” more frequently. The staff member stated that perhaps being physically separated from others in the classroom (as in the case when students were outside) alleviated some of the maladjusted behaviors described as common with Student 3. The staff member shared that staying inside the classroom, absent the other students, seemed to alleviate some of the problematic behaviors which Student 3 had previously demonstrated.

Quantitative Data: B Period

The final period of intervention concluded on December 17, 2010. As was the case with each of the research project time periods, quantitative data was collected for later interpretation. The staff working with Student 3 once again completed a PCBS assessment at the conclusion of the final B Period (December 17, 2010). The results are posted in Table XXIV.
Table XXIV was completed by the same staff member who had completed the two previous PCBS assessments. Student 3 was recorded as having few occasions of socially positive interactions and behaviors in some instances while some indicators show higher levels of positive social behavior. Therefore, the results of the PCBS scores led to more questions than answers in the case of Student 3.

In order to visualize the three PCBS scores, Table XXV is provided below. All three PCBS inscores are shown together in order to compare graphing of behaviors and affect.
In order to ascertain differences, collected PCBS scores over three periods was utilized. The differences and similarities among indicators are interesting. While many scores are identical over the course of the research project, the behavioral and affective indicators which show improvement over the administration are of most interest.

*Qualitative Data: B Period*

The final stage of the research project provided a concluding set of qualitative data by which comparisons were able to be made. Research personnel again tracked Student 3’s behavior and recorded thoughts and observations via a communication log between school and home. Notes of interest are included in Table XXVI.
As noted in the log entries, Student 3’s behavior and mannerisms varied each week. Anecdotal data, as provided in the log entries, suggest that Student 3 became accustomed to the concept of “Nature, Nurture, Knowledge”. A, significant amount of data demonstrates a change in behavior during the intervention versus absent the intervention.

<table>
<thead>
<tr>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“Speech went well – brought out a book to read in Courtyard but was more interested in walking around and looking at the pond.”</td>
</tr>
<tr>
<td>December 2</td>
<td>“Went out to Courtyard for science.”</td>
</tr>
<tr>
<td>December 10</td>
<td>“Entering cafeteria for assembly [Student 3] bolted back to BHMCS ILC.”</td>
</tr>
<tr>
<td>December 14</td>
<td>“Went over social story for 9:00 concert – seemed like he might make it through concert. He got up and walked fast out of gym. Practiced personal safety and awareness. Out in Courtyard talked about clouds.”</td>
</tr>
<tr>
<td>December 15</td>
<td>“Indoor recess – played well with friends. When recess was over [Student 3] ran from room.”</td>
</tr>
</tbody>
</table>
Interview Data: B Period

Student 3 was not available for a post intervention interview. Due to Student 3’s absenteeism a close-out interview was not conducted.

Staff Interview Data: B Period

The teaching staff member most closely linked with Student 3 throughout the intervention was interviewed on December 22, 2010. The staff member felt that Student 3 was not impacted academically with the infusion of outdoor, experiential, nature-based programming. Much concern was expressed over the weather conditions and the pragmatic application of going outside during colder months. In particular, the need to go outside in cold conditions was questioned, and as explained to the staff, due to the nature of the research project and self-imposed time limits, student participation in the research project occurred, at times, in less than ideal conditions. Overall, the staff member interviewed felt that if the circumstances (inclusive of weather) could have been modified, dramatic improvement in academic proficiency and behavior may have been evidenced.

Student 4

Student 4, a grade five male, is diagnosed with depression and falls on the Autism Spectrum. Cognitively, the student is considered average to above average ability. Student 4 physically appears to be a typical youngster. His affect is often quite negative and he is resistant to participating with peers or adults. Student 4 has a history of bullying and aggressive behavior toward peers and adults. Poor social skills include excessive negativity, hiding under tables or
desks, and overall defiance. The student receives support from a paraprofessional while in the typical classroom for mainstreamed activities and in the cafeteria as well as in the BHMCS ILC.

Quantitative and qualitative data were gathered on Student 4 during the B, A, and final B periods of the research project. Data is provided in the proceeding pages in the form of B Period, followed by A Period, followed by B Period.

Quantitative Data: B Period

Student 4 was a participant in “Nature, Nurture, Knowledge” from October 18, 2010 through November 5, 2010. Student 4 was oppositional in regard to going outdoors and was a resistant participant. The paraprofessional staff member assigned to Student 4 attempted to bring him outside in order to participate in the research project and integrate the nuances of outdoor, experiential, nature-based instruction into the established BHMCS curriculum. On many occasions, Student 4 refused to participate. In order to avoid disruptive behavior, at times, Student 4 was allowed by the assigned paraprofessional to forego participation. Staff worked to bring Student 4 outdoors, yet many attempts were abandoned due to the need to maintain order and avoid overly negative student behaviors.

Quantitative data in the form of PCBS scores were gathered at the conclusion of the B Period. The staff member working most closely with Student 4 was asked to complete the short assessment. Table XXVII shows the PCBS Scores of Student 4, as noted by teaching staff, below:
The PCBS scores in Table XXVII show high frequency of some indicators and lesser frequency of others. As noted by Dayton (1967) the PCBS is a quick assessment of student behavior as interpreted by teaching staff. The high incidences of negative behaviors is clearly evident within the data.

**Qualitative Data: B Period**

During the initial intervention period, Student 4 was prompted to go outside in order to engage in outdoor, experiential, and nature-based instruction. As noted previously, Student 4 demonstrated little interest in going outdoors and, in fact, was resistant. Table XXVIII provides qualitative data as taken from personal teacher log entries.
<table>
<thead>
<tr>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 18</td>
<td>“Attempted to go to Courtyard but [Student 4] wanted to stay in room 125.”</td>
</tr>
<tr>
<td>October 20</td>
<td>“Again [Student 4] did not want to go outside but completed a great deal of work in room 125.”</td>
</tr>
<tr>
<td>October 22</td>
<td>“Too cold, really bad morning – refusal to work / loss of legos.”</td>
</tr>
<tr>
<td>October 25</td>
<td>“non-compliant behavior today, ran out of time to go outside.”</td>
</tr>
<tr>
<td>October 26</td>
<td>“Another challenging morning…at nurse’s office from 9:00 a.m. to 11:00 a.m.”</td>
</tr>
<tr>
<td>October 28</td>
<td>“A great day! Resistant at first to going outside ‘no, I hate it outside’, ‘not the courtyard’. Despite arguing we did head outside – climbed up to boardwalk, talked about the ducks, finding four-leaf clovers. Stated ‘I’m lucky’. At least a positive comment.”</td>
</tr>
<tr>
<td>November 1</td>
<td>“Student 4 quoted with ‘No, not outside, why”</td>
</tr>
</tbody>
</table>
do you always want me to go outside?”

<table>
<thead>
<tr>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 2</td>
<td>“Having a good time using video camera – did not want to go outside.”</td>
</tr>
<tr>
<td>November 3</td>
<td>“Worked on mask project outside. Didn’t want to finish science outside.”</td>
</tr>
</tbody>
</table>

Qualitative data found in Table XXVIII provides insight into the negative affect on the part of Student 4. While the teaching staff wanted to participate in the research project with Student 4, chronic negativity was noted.

In addition to the notations made from the paraprofessional assigned to Student 4 in the teacher log book, school to home journal entries served as qualitative data for the doctoral project report. Table XXIX shows the commentary between school and home over the B period of the intervention.

Table XXIX

<table>
<thead>
<tr>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 20</td>
<td>“Excited about Legos after school.”</td>
</tr>
<tr>
<td>October 21</td>
<td>“Had a difficult time settling in this morning.”</td>
</tr>
<tr>
<td>October 22</td>
<td>“Another rough start when it was time to begin work. Really pulled it together today and did some terrific work.”</td>
</tr>
<tr>
<td>October 25</td>
<td>“Refused to complete student daily review.”</td>
</tr>
<tr>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>October 27</td>
<td>“Was resistant to going to music but was able to compose himself to sit in most of the class and then do recycling and complete work at the end of the day.”</td>
</tr>
<tr>
<td>October 28</td>
<td>“Completed morning math work. Field trip. In gym [Student 4] was ‘King of the Gym’ and loved playing flag football.”</td>
</tr>
<tr>
<td>November 1</td>
<td>[Student 4] had difficulty entering the classroom this morning and joining the speech group.”</td>
</tr>
<tr>
<td>November 2</td>
<td>“Very nice participation in speech group. Creating compass rose in art.”</td>
</tr>
<tr>
<td>November 3</td>
<td>“Difficult to get him to focus and he was quite argumentative. Much better afternoon.”</td>
</tr>
<tr>
<td>November 4</td>
<td>“Did not want to enter the classroom for homeroom or remove his coat. Picture retake tomorrow – any suggestions to encourage a smile?”</td>
</tr>
<tr>
<td>November 5</td>
<td>“Behaved appropriately in homeroom. Today was full of ups and downs.”</td>
</tr>
</tbody>
</table>
Table XXIX provides additional qualitative data on Student 4. The comments provide information to the reader which shows a common thread of negative affect. The communication log, while containing some positive commentary, suggests more difficulty during the school day than ease.

*Interview Data: B Period*

Student 4 was interviewed at the conclusion of the first period of intervention. Student 4 had returned to the classroom with the one-on-one paraprofessional assigned to him and was given a cup of hot chocolate. Student 4 required reassurance that he was not in trouble. Prior to beginning the interview, a review of the last few weeks was provided. The following questions were posed and received responses. *Question: Do you think that going outside changed your learning?* The student articulated that he didn’t feel there was a value in going outdoors for his instruction. He stated, “Not really. A little bit changed, but it didn’t really make a difference.” He continued with the fact that he really didn’t like going outdoors because it was either “too hot or freezing”. *Question: Did going outside change your behavior?* With this prompt Student 4 shared that going outdoors had no impact on his behavior. Through conversation he seemed to waffle and gave an instance from the beginning of the school year. “At the beginning of the year I liked it. I saw a duck.” This was in reference to a mallard that was residing in the courtyard pond. Student 4 further shared that being outside “didn’t help with science maybe, well not
really in ELA” and continued with his negative association with the outdoors and participation in “Nature, Nurture, Knowledge.”

Staff Interview Data:  B Period

The staff member charged with working most closely with Student 4 was interviewed at the conclusion of the first intervention period. The following narrative outlines the questions asked and responses generated. The interview with the paraprofessional occurred in a separate area of the classroom whereby privacy was ensured. How do you feel that “Nature, Nurture, Knowledge” impacted the students academically? was asked first. The paraprofessional responded with, “It was probably mostly neutral. But in fact, it was more to the negative. His work behavior varies so much on a daily basis. When he is in a mood to get work done he will do it – other times not at all. Most of the time he simply complained and resisted to going outside. I think it was only two times that we could get him out. He resisted most of the time.”

The second questions, What types of academic changes occurred when the students were outside, in nature, and having experiential lessons? received a similar response. The paraprofessional responded with, “No changes academically”. Ultimately, the interviewee reported that the behaviors were negative; however, the same could be stated about when Student 4 was indoors as well. Behaviorally, there were more opportunities for him to be negative according to the instructor when Student 4 was asked to participate in outdoor, nature-based, experiential learning in the BHMCS Courtyard. The teacher stated, “he always responded in a negative fashion despite a positive twist. His performance was the same as inside – once he was doing the work it
was the same”. The final question, *Do you feel that one subject (science of ELA) was better suited to be an outdoors, nature-based, experiential curricula?* was responded to again with little surety. In terms of content, the instructor felt that science might be better taught outdoors when compared to English language arts. The teacher closed the interview by sharing a sense that the students – with significant disabilities – may not react well to change in routine and that is wherein the difficulty lies.

*Quantitative Data: A Period*

Following the first intervention period, a period of non-intervention occurred. Quantitative as well as qualitative data were collected in order to make comparisons and add to the level of information for the research project. The primary quantitative data set surrounding Student 4 for the A Period of the research project, as with all subjects, was the PCBS scores. Table XXX reflects the scores on the PCBS for the second time period.
Table XXX shows a wide range of scores for Student 4 in regard to behavior and affect. The PCBS assessment data derived during the non-intervention period shows high frequencies of inappropriate or unwanted behavior.

**Qualitative Data: A Period**

Unfortunately, research personnel did not maintain a log of observations on Student 4’s behavior or affect over the period of non-intervention. Therefore, a piece of the qualitative data which was utilized during the B Period can not be evaluated. Fortunately, school to home
communication sheets continued throughout the A Period of the research project. Table XXXI provides information found on the daily communication sheets.

Table XXXI

<table>
<thead>
<tr>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 8</td>
<td>“Good job in homeroom and speech lesson. Worked on health packet: recognizing bullying and understanding anger.”</td>
</tr>
<tr>
<td>November 9</td>
<td>“Did an outstanding job in lunch group.”</td>
</tr>
<tr>
<td>November 10</td>
<td>“Today was a challenging day. Had difficulty following directions and displaying appropriate behavior.”</td>
</tr>
<tr>
<td>November 12</td>
<td>“Good lunch. Finally outdoor recess.”</td>
</tr>
<tr>
<td>November 15</td>
<td>“Completetd health worksheets and art project.”</td>
</tr>
<tr>
<td>November 17</td>
<td>“Studying adjectives in ELA and began working on a tudy guide for Explorers Test.”</td>
</tr>
<tr>
<td>November 18</td>
<td>“We asked [Student 4] not to bring any Lego figures with weapons to school.”</td>
</tr>
<tr>
<td>November 22</td>
<td>“Self conscious about haircut this morning and refused to take his hood off…a rough start.”</td>
</tr>
</tbody>
</table>
November 23

“[Student 4] wasn’t as engaged in speech group today as yesterday.”

Table XXXI provides qualitative data on the feelings of Student 4 while the intervention was stopped. The perceptions are from the staff member who worked most closely with the student over the A Period. The data and commentary shows varying positive to negative behaviors and affect over the course of the non-intervention.

**Interview Data: A Period**

Student 4 was interviewed at the conclusion of the A, or non-intervention, period. As was the case during the interview session for the first time period, Student 4 verged on being non-cooperative. The paraprofessional who worked most closely with Student 4 was present for the questioning. The following questions were posed: *How did staying inside over the last three weeks help you behave? How did staying inside over the last three weeks help your learning?* Responses to the questions included brief statements without elaboration. Student 4 stated that he was “doing all class work” and that returning to the typical teaching practices within the typical classrooms made “no difference”. Finally, regarding affect and behavior, Student 4 shared that his behavior was the same as always. When prompted to articulate his feelings about going outdoors versus staying inside the student shared, “going outside makes everything worse. There is nothing inside to look at.” Student 4 did share that he always “goes sledding and makes
snow houses” which appeared inconsistent with his distaste for the outdoors during the doctoral research project.

Staff Interview: A Period

Unfortunately, due to staff reassignment and personnel issues; the A Period Staff Interview was not conducted.

Quantitative Data: B Period

The final period of intervention, also known as B Period, occurred from November 29, 2010 to December 17, 2010. At the conclusion of the B Period, a final PCBS was taken by the staff who worked most closely with Student 4. Table XXXII shows the results of the PCBS.

Table XXXII

![12/17/2010 chart]
Table XXXII shows that there was little to no change witnessed in Student 4 pre and post intervention. As articulated previously, Student 4 demonstrated a resistance to the intervention and, often times, was not part of the participating group. Teaching personnel did not attempt to force the student outdoors and into the auspices of “Nature, Nurture, Knowledge” because of the perceived repercussions in behavior for doing so.

Table XXXIII shows the three PCBS scores in one graph. The data on Student 4 over the course of the three periods of the doctoral research project shows the changes in scores. While many of the scores are similar, there are some changes noted in the three different assessment periods.
Qualitative Data: B Period

Teaching staff maintained a personal log on Student 4 during the final period of intervention. The time frame of November 29, 2010 through December 10, 2010 was tracked by the paraprofessional responsible for Student 4. The personal log book contains entries which are considered part of the qualitative data collected during the last period of the research project. Portions of the log are captured in Table XXXIV:

Table XXXIV

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“No time…recycling meeting.”</td>
</tr>
<tr>
<td>November 30</td>
<td>“No time…I had a meeting at 1:00 p.m.”</td>
</tr>
<tr>
<td>December 1</td>
<td>“No time…transition to behavior intervention plan.”</td>
</tr>
<tr>
<td>December 2</td>
<td>“No time…transition to behavior intervention plan.”</td>
</tr>
<tr>
<td>December 6</td>
<td>“Outside to courtyard to review for states of matter assessment. [Student 4] answered all of my questions with ‘I don’t know’. I suggested walking a talking.”</td>
</tr>
<tr>
<td>December 7</td>
<td>“Half Day”</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>December 8</td>
<td>“Suggested taking reading outside, preferred to do in room 231. Suggested taking ELA homework outside, preferred doing it in room 125.”</td>
</tr>
<tr>
<td>December 9</td>
<td>Half day</td>
</tr>
<tr>
<td>December 10</td>
<td>“We can work on daily geography and ELA quizzes in here or go outside and do it received ‘what you want me to die out there? Last time I was freezing’.”</td>
</tr>
<tr>
<td>December 13</td>
<td>Rain</td>
</tr>
<tr>
<td>December 14</td>
<td>“Went outside at noon despite much resistance. Boys were complaining about the cold and asked to run around to get warm.”</td>
</tr>
<tr>
<td>December 15</td>
<td>Too cold</td>
</tr>
<tr>
<td>December 16</td>
<td>No time</td>
</tr>
<tr>
<td>December 20</td>
<td>Out</td>
</tr>
</tbody>
</table>

Table XXXIV provides interesting data in regard to implementation of the intervention. The comments provided demonstrate variable commitment in participating on the part of the paraprofessional assigned to Student 4. The data, while interesting, provides insight into the
level or lack-of commitment the staff member invested in the project. Overall, the written log provided by the paraprofessional demonstrates little impact as the times in which Student 4 went outside appear sporadic at best. In addition, the negativity of the experience exudes in both the commentary of the teacher as well as the student. It should be noted that the paraprofessional initially wanted to participate in the study and over time became resistant to the idea of going outdoors with her student.

In addition to the paraprofessional log entries, school to home journal entries served as qualitative data for the doctoral project. The following table contains parts of the written communications sent to the parents of Student 4 during the final period of the research project.

Table XXXV

<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“Great transition back to school after our long break. Did not eat lunch today – enjoyed recess. Completed a health packet and attended a recycling presentation.”</td>
</tr>
<tr>
<td>December 1</td>
<td>“Entered room and listened politely to instructions. Earned fifteen minutes of computer time.”</td>
</tr>
<tr>
<td>December 2</td>
<td>“No work completed – removed from room 230. Completed work with Assistant Principal.”</td>
</tr>
<tr>
<td>Date</td>
<td>Remarks</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>December 3</td>
<td>“Poor behavior in room and hallway. Did not order lunch. Good job in Spanish.”</td>
</tr>
<tr>
<td>December 6</td>
<td>“More argumentative but completed math homework.”</td>
</tr>
<tr>
<td>December 8</td>
<td>“Smooth transitions and appropriate classroom behavior.”</td>
</tr>
<tr>
<td>December 9</td>
<td>“Great job – half day.”</td>
</tr>
<tr>
<td>December 10</td>
<td>“Wouldn’t order lunch, argumentative all morning. Played decimal war and finally completed one math problem in order to earn a break.”</td>
</tr>
<tr>
<td>December 13</td>
<td>“Ordered lunch. Argued and refused to work until 10:00 a.m. Better day tomorrow?”</td>
</tr>
<tr>
<td>December 14</td>
<td>“Nice job. Speech – good. Outside for lunch and recess.”</td>
</tr>
<tr>
<td>December 15</td>
<td>“Constant arguing and refusing assistance in math. Continued complaining. Refused to do homework.”</td>
</tr>
<tr>
<td>December 16</td>
<td>“Refusal to do work.” “</td>
</tr>
</tbody>
</table>
December 17

“Entered room and ordered lunch. Finished map worksheet. “

The entries made in the school to home communication log found in Table XXXV, while used as qualitative data for the doctoral project report, show an inconsistency in applying the use of outdoor, experiential, and nature-based learning. Many entries note student refusal to do assigned tasks within the mainstream classroom.

*Interview Data: B Period*

Student 4 was interviewed at the conclusion of the intervention period. The interview was conducted in the BHMCS ILC classroom. The interviewer sat with Student 4 in a quiet part of the classroom separated from other students and staff to ensure privacy. Student 4 was then asked the predetermined questions. Question one, *How did going outside over the last three weeks help you behave?* was responded with, “same as always – doesn’t make me change.” A follow up question of *How did going outside help your learning?* was answered with, “Not really anything – I didn’t like outside. I hate being outside.” The interview provided insight into the negativity elicited from Student 4 regarding “Nature, Nurture, Knowledge” and provided insight into the thoughts and feelings of the participant.

*Staff Interview Data: B Period*

One paraprofessional was charged with working with Student 4 over the entire timeframe of the final intervention period. In order to gather more qualitative data on the impact of the
program, a final interview was conducted. The following outlines the interview questions and subsequent responses. The first question, *How do you feel that being outside impacted the student academically?* elicited the following paraprofessional response of “It was difficult to work into the schedule. Many complaints about the cold.” The paraprofessional further revealed that she felt it was most challenging to have the student go outdoors and that being outside did not make an impact on the student’s academic proficiency. The second question, *What types of academic changes occurred when the student went outside?* received a similar response. The paraprofessional answered the question by stating that she didn’t feel there were any changes. In fact, the recorder noted that the paraprofessional stated that she wished that more time had been allocated for the development of different lesson plans for use outdoors as opposed to simply bringing the existing forms of academic work outdoors. When asked about behavior, in the form of *“How do you feel that being outside impacted students behaviorally?”* again, little evidence of success emerged. In her response to the question, the paraprofessional noted that it was a challenge to bring the student outside and that overall resistance and complaining emerged.

**Student 5**

Student 5 is a grade four male. The student fits the description of having a form of autism and has been identified as being on the spectrum for autistic behavior. At times, Student 5 displays high academic functioning as cognitively, he is average to above average in intellect. Student 5 has a history of becoming agitated, frustrated, and complaining. Poor social skills define the student and socially he is sometimes unable to participate in typical situations with his
peers. The student is mainstreamed into typical classes when possible and spends a good deal of
time within the BHMCS ILC receiving a more individualized approach to instruction.

Quantitative and qualitative data were gathered on Student 5 during the B, A, and final B
periods of the research project. The data provided in the following pages are grouped by time
period of the intervention, non-intervention, and final intervention periods.

**Quantitative Data: B Period**

Student 5 was a participant in “Nature, Nurture, Knowledge” during the B Period
(October 18, 20102 through November 5, 2010) of “Nature, Nurture, Knowledge” and was a
willing participant. The student participated in the program in conjunction with another student
as both were under the supervision of a shared paraprofessional. At the conclusion of the
intervention, the paraprofessional who worked most closely with Student 5 was asked to
complete a PCBS in order to gain quantitative data for the research project. The information in
Table XXXVI represents the scores Student 5 received on the PCBS as determined by the
teaching staff.
The PCBS scores show that Student 5 had relatively poor social skills as assessed by the teaching staff during the B Period of the intervention. The low range of incidences on positive behaviors and high incidence of negative behaviors are consistent with other PCBS scores of students in the BHMCS ILC.

**Qualitative Data: B Period**

Student 5 was a willing participant in the initial intervention period of “Nature, Nurture, Knowledge. In order to elicit qualitative data in regard to the thoughts and feelings of Student 5, a daily log was maintained by the paraprofessional assigned. In addition, school to parent communication logs were maintained and recorded as part of the research. Table XXXVII
Table XXXVII

<table>
<thead>
<tr>
<th>Date</th>
<th>Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 18</td>
<td>“Read story of the week in courtyard. Seemed to enjoy it. Commented, ‘it is nice and fresh’.”</td>
</tr>
<tr>
<td>October 20</td>
<td>“Read about minerals in courtyard. Student stated, ‘it is a nice day, I like it, the sun is shining, and it is good working outside’.”</td>
</tr>
<tr>
<td>October 21</td>
<td>“The student finished a page in this spelling workbook in the courtyard. He totally enjoyed it. Student wrote that he loves nature.”</td>
</tr>
<tr>
<td>October 22</td>
<td>“Completed work in courtyard. Did complain today and did not do his best work – uncooperative and whiny.”</td>
</tr>
<tr>
<td>October 25</td>
<td>“Outside in courtyard. Student stated, ‘oh, nature is so beautiful!’.”</td>
</tr>
<tr>
<td>October 26</td>
<td>“Read this week’s story in courtyard. Did a great job and said he enjoyed being outside.”</td>
</tr>
<tr>
<td>November 2</td>
<td>“Complained about the cold.”</td>
</tr>
</tbody>
</table>
November 3  “Worked on science in courtyard. Student asked what kind of animals live in the courtyard. Student answered when prompted about what had been seen so far – ‘dragonfly, sparrow, and crow’.”

The anecdotal data in Table XXXVII contains positive affirmation to Student 5’s engagement in the intervention. The journal entries contain more positive comments than negative in regard to Student 5 and the infusion of “Nature, Nurture, Knowledge.”

In addition to the personal paraprofessional log entries, further qualitative data was collected in the form of school to parent communication log recordings. The following comments in Table XXXVIII contain information from the log:

Table XXXVIII

<table>
<thead>
<tr>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 18</td>
<td>“Playful mood / demeanor. Read in the courtyard.”</td>
</tr>
<tr>
<td>October 20</td>
<td>“Acted out during morning meeting – ran out of room. Did science in courtyard and answered questions on passage with 100% accuracy.”</td>
</tr>
<tr>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>October 21</td>
<td>“Disruptive during correction time, pulled it together. Did great in group speech. Did spelling in courtyard – he loves it there.”</td>
</tr>
<tr>
<td>October 22</td>
<td>“Went outside for science – uncooperative – but managed to finish work.”</td>
</tr>
<tr>
<td>October 26</td>
<td>“Read week’s story I courtyard. Did a great job.”</td>
</tr>
<tr>
<td>October 28</td>
<td>“Whined and flopped on floor during homeroom. Outside for spelling work. Read and answered questions on the life of a rock.”</td>
</tr>
<tr>
<td>November 2</td>
<td>“Complete non-compliance in gym. Very difficult time. Outside for science.”</td>
</tr>
<tr>
<td>November 3</td>
<td>“Yelling and hitting staff member.”</td>
</tr>
</tbody>
</table>

Information provided through school-to-home log entries contained in Table XXXVIII show varying positive and negative behaviors within the B Period. The behavior of Student 5 during the intervention, as noted by the teaching staff member who filled out the log books, included a wide range of displays. Complete compliance and joyfulness was noted in addition to aggressiveness during the time period.
Interview Data: B Period

At the conclusion of the initial B Period of intervention, Student 5 was interviewed in order to elicit his feeling on the intervention. The first question asked was whether or not the student enjoyed being outside in the Courtyard. Student 5 responded with “yeah.” When prompted to elaborate, the student was able to share, “it makes me want to go on bird watches. It was so beautiful I just wanted to learn about nature.” A second question was posed in order to determine whether or not the student felt that going outside helped with school work. Student 5 responded with an affirmative and continued by stating “it helped in writing” and that he was able to concentrate better outside even when he was doing his work. The final question, whether or not going outside changed your behavior, was answered by Student 5 with, “well, not that much, but a little.” The student articulated that he liked being in the Courtyard and he liked to do the work outside because “nature is so wonderful, there is a lot to see, do, and explore in the woods.” When questioned about how his behavior had been influenced through the intervention, Student 5 stated that “being outside made me act really well.”

Staff Interview Data: B Period

The paraprofessional assigned to Student 5 was interviewed at the conclusion of the initial intervention period. The first question posed was “how do you feel that “Nature, Nurture, Knowledge” impacted the student academically?” The paraprofessional responded with, “[Student 5] really enjoyed it, so I think he focused outside. He did complain some days because of the cold. When he bucked it was due to the interest inside.” The question of whether or not
the student was impacted academically was answered with, “He was very pleasant but academically I can’t see there was much change. I’m not sure he did better academically outside than inside”. When questioned about the impact “Nature, Nurture, Knowledge” had on Student 5 behaviorally, the paraprofessional reported that the student whined less frequently. She stated “he really was enjoyable” and “he behaved well.” Further, the paraprofessional noted that the student was much less agitated outside and socially more pleasant to be around when outside. In regard to whether or not science or English language arts was better suited for the program, the paraprofessional did not have a strong feeling on either subject area.

Quantitative Data: A Period

Quantitative data was once again collected on Student 5 during the A Period of the research project. This period, November 9, 2010 to November 23, 2010 served as a period of time in which the intervention was withheld. The staff member working directly with Student 5 over the aforementioned time period was asked to again fill out the PCBS. Results are shown in Table XXXIX.
Table XXXIX shows data on Student 5 which is consistent with the negative behaviors and affect associated with students in the BHMCS ILC. Incidences of empathy or positive interactions with peers are infrequent. In contrast, higher incidences of negative behaviors are noted in the bar graphs.

Qualitative Data: A Period

As in the case during the B Period of intervention, research staff documented personal observations and recorded comments during the A Period, or non-intervention period, which might allow for insight into the feelings, thoughts, and behaviors of Student 5 during the hiatus. Table XL captures the personal log entries of the paraprofessional who worked most closely with Student 5 during the time period in which “Nature, Nurture, Knowledge” was withheld.
Table XL

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 8</td>
<td>“Trip to JFK Museum and Zion Union Museum. Did not mention going out in the Courtyard – could be because of the rain.”</td>
</tr>
<tr>
<td>November 9</td>
<td>“Whined about long test, but did not mention going outside – once again it is raining.”</td>
</tr>
<tr>
<td>November 16</td>
<td>Read story of the week – much complaining and whining – did not mention outdoors.</td>
</tr>
<tr>
<td>November 17</td>
<td>Worked on spelling – did not mention going outside.</td>
</tr>
<tr>
<td>November 19</td>
<td>Took spelling, selection, and science tests with breaks. Great job- no whining, did not mention going outside.</td>
</tr>
<tr>
<td>November 22</td>
<td>Read story and answered questions. No talk of outside.</td>
</tr>
<tr>
<td>November 23</td>
<td>Read several passages – did not ask about going outside.</td>
</tr>
</tbody>
</table>

The data contained in Table XL show that Student 5 did not mention going into the BHMCS Courtyard or outdoors over the period of non-intervention. The lack of interest in continuing the
intervention is seen throughout the hiatus. The behavior of Student 5, as noted in the journal entries, was not problematic. Overall, the entries lead the reader to believe that the student did not miss the auspices of “Nature, Nurture, Knowledge” through verbal communication.

School to home communication logs served as a second source of qualitative data on the impact A Period had on Student 5. The following data contained in Table XLII provides excerpts from the communication log which was sent home on a daily basis during the period of non-intervention.

Table XLII

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 5</td>
<td>“Morning work and meeting a bit talkative but settled down.”</td>
</tr>
<tr>
<td>November 8</td>
<td>“Sat through video on Kennedy’s election. When it was time to walk around museum became whiny and non-cooperative. Better compliance in second museum.”</td>
</tr>
<tr>
<td>November 9</td>
<td>“Went after another student and hit two staff members. Brought to principal’s office and sent home.”</td>
</tr>
<tr>
<td>November 16</td>
<td>“Difficult time in gym- non compliant.”</td>
</tr>
<tr>
<td>November 17</td>
<td>“Morning went well. Afternoon loud and disruptive – never really gave full attention.”</td>
</tr>
</tbody>
</table>
November 19

“Had his best day since school started. We had our happy faces on all day!”

November 22

“Morning work, speech, reading. Whined quite a bit, flopped on floor, refusal behavior.”

Table XXXII sheds light onto behaviors demonstrated by Student 5 absent the intervention during the research project. The communication to home clearly indicates a spike in negative behaviors as displayed by Student 5 absent the intervention. Typical maladjusted behaviors such as defiance, work refusal, dropping to the floor, and more occurred.

*Interview Data: A Period*

At the conclusion of the A Period of “Nature, Nurture, Knowledge” Student 5 was interviewed. The first question, *“How did staying inside over the last three weeks help you behave?”* was answered in an ambivalent way. Student 5 responded that he liked being both inside and outside and that, in fact, “both help you behave”. A second question about the ways in which staying inside over the span of three weeks assisted in academic achievement was also answered in a fantasy-like manner. Student 5 stated that his grades were “pretty good” and that in reality; his grades were “well probably double and triple A’s”. Further questioning and probing gleaned no further information.
Staff Interview Data: A Period

Staff who worked directly with Student 5 were interviewed at the conclusion of the non-intervention period. When questioned about the impact the hiatus period had on the student academically and behaviorally, the paraprofessional felt there was an increase in negative behaviors. Specifically, the instructor noted that there had been several more negative interactions between classmates during the A Period. It was noted by the staff member that perhaps the negative behaviors occurred because of the close proximity between the youngsters. Thus, in a roundabout way, the simple act of going outdoors and separating the students served to benefit all. The data collected from the staff interview leads the reader to believe that Student 5 benefited socially, emotionally, and behaviorally when able to go outside and engage in nature-based and experiential learning.

Quantitative Data: B Period

The last stage of the intervention was considered the final B Period which spanned from November 29, 2010 to December 17, 2010. Student 5 was engaged in outdoor, nature-based, experiential learning for three weeks as weather permitted in order to conclude the B-A-B model of intervention – hiatus - intervention. Data in Table XLIII provides the PCBS score which were gathered. The PCBS was completed by the paraprofessional who worked most closely with Student 5 throughout the intervention on December 17, 2010.
As seen in the table above, Student 5 struggled with positive social attributes and behaviors even with the conclusion of the research project according to the paraprofessional completing the PCBS.

Table XLIV provides a graph in which to visualize the changes or stability of scores over the three administrations of the PCBS for Student 5. The staff member completing the PCBS was constant.
The comparison between all three PCBS scores over the course of the research project as seen in Table XLIV demonstrate a consistent reporting on the part of the paraprofessional who worked most closely with Student 5 over the course of the research project. While anecdotal feedback and qualitative data may have presented information to show changes in behavior, the results of the PCBS administration show that many negative behaviors remained unchanged with each administration of the assessment.

**Qualitative Data: B Period**

The last B Period of the research project provided a means by which to collect final qualitative data from student and staff participants. Research personnel tracked and logged
student commentary and documented significant findings in personal log books. Table XLV contains the observations of staff working directly with Student 5 during the final period of the intervention.

Table XLV

<table>
<thead>
<tr>
<th>Date</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“Finished spelling worksheet in courtyard. Made comments about the cold, needing a jacket, and the need to move around due to the cold.”</td>
</tr>
<tr>
<td>November 30</td>
<td>“Went outside for spelling but too cold to stay.”</td>
</tr>
<tr>
<td>December 1</td>
<td>“Much complaining about weather.”</td>
</tr>
<tr>
<td>December 2</td>
<td>“Working outside [Student 5] stated, “It’s kind of cold, but it is still beautiful out here.”</td>
</tr>
<tr>
<td>December 6</td>
<td>“Suggested going outside but met with complains due to excessive cold.”</td>
</tr>
<tr>
<td>December 7</td>
<td>“Half day of school – very cold. [Student 5] stated, “I don’t want to go out tomorrow.”</td>
</tr>
<tr>
<td>December 8</td>
<td>“Sent to Prevention Office then sent home due to behavioral issues.”</td>
</tr>
<tr>
<td>December 10</td>
<td>“Out in Courtyard and very cold.”</td>
</tr>
<tr>
<td>December 14</td>
<td>“[Student 5] outside for ELA and reading comprehension. Student stated, ‘December is too cold for me to go outside’.”</td>
</tr>
<tr>
<td>December 15</td>
<td>“[Student 5] completed spelling in courtyard. [Student 5] stated, ‘My hands are too cold…look at all the birds flying around’.”</td>
</tr>
<tr>
<td>December 16</td>
<td>“[Student 5] stated, ‘It’s cold outside, but I still did it!’.”</td>
</tr>
<tr>
<td>December 17</td>
<td>“Read about water cycle in Courtyard and complained a little. Back to business and did really well.”</td>
</tr>
</tbody>
</table>

The information collected from the staff log entries shows a continued interest on the part of Student 5 to participate in the outdoor, nature-based, experiential program. While the student did comment on weather conditions, the perceptions of being outdoors, as reported by the staff member, appear more positive than negative.

Additional qualitative data was gleaned from the school to home communication logs. Thoughts, feelings, and behaviors were noted in the communication book for Student 5 and are noted in Table XLVI.
<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29</td>
<td>“Good mood / demeanor. Completed morning work and answered questions appropriately.”</td>
</tr>
<tr>
<td>November 30</td>
<td>“Had a difficult time in gym – refused to participate and follow directions. Went outside for spelling and completed work. A bit disruptive in math.”</td>
</tr>
<tr>
<td>December 1</td>
<td>“Good job in music. Difficult time when menu change announced. Worked on spelling in Courtyard.”</td>
</tr>
<tr>
<td>December 2</td>
<td>“Good job today at morning meeting. Spent time with counselor. Completed work in courtyard.”</td>
</tr>
<tr>
<td>December 6</td>
<td>“Complained and rolled on floor during spelling. Brought to assistant principal’s office.”</td>
</tr>
<tr>
<td>December 7</td>
<td>“Very poor behavior in gym today- non compliant. Started spelling in Courtyard – finished inside because of the cold.”</td>
</tr>
<tr>
<td>Date</td>
<td>Comments</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>December 8</td>
<td>“Became disruptive during morning meeting. Hit paraprofessional and brought to prevention office.”</td>
</tr>
<tr>
<td>December 10</td>
<td>“Hit another student and was brought to ILC for timeout. Regrouped and then disruptive at lunch.”</td>
</tr>
<tr>
<td>December 13</td>
<td>“Spent time with district autism specialist. Outburst at end of day but was able to regain composure.”</td>
</tr>
<tr>
<td>December 14</td>
<td>“Focused on typing today. Read the week’s story in silence.”</td>
</tr>
<tr>
<td>December 15</td>
<td>“Good job in music. Played well with friends during indoor recess.”</td>
</tr>
</tbody>
</table>

As was the case in previous qualitative data, the information gleaned from the school to home / parent communication log was more positive than negative in terms of student behavior and affect. Overall, maladjusted behaviors appeared to be lessened according to log entries.

*Interview Data: B Period*

Student 5 was not interviewed at the conclusion of the intervention period due to an extended absence during the period of time in which interviews were to take place.
Staff Interview Data: B Period

The staff member who worked most closely with Student 5 during the final weeks of the research project was interviewed. The responses collected provided further qualitative data necessary for a complete understanding of the impact “Nature, Nurture, Knowledge” had on Student 5. The paraprofessional who worked most closely with Student 5 throughout the final B Period of the research project was asked specific questions. The first question, *How do you feel that being outside impacted the student academically?* elicited a response more about weather than programming. The staff member stated that the cold weather did not allow for academic improvement as the student complained frequently about the elements. When asked about the types of academic changes that occurred, the paraprofessional stated that there was little change in academic proficiency. In terms of behavior, when asked how being outside impacted the student behaviorally, the paraprofessional again returned to the distraction of the weather. Specifically, the staff member stated that there was more complaining due to the cold and, had the weather been better, the results may have been different. The paraprofessional did state that despite the increase in complaints, the student did notice the birds in the Courtyard and all was not lost despite the cold.

Cohort Comparisons

Qualitative data, in the form of PCBS scores, collected on each of the five students in the research project, was utilized to make comparisons of the cohort as a whole. Valuable insights
were seen when the scores of all students were compared using the PCBS scores as collected during each period of the research project. The positive, negative, and neutral impact the infusion, hiatus, and final infusion of “Nature, Nurture, Knowledge” had on each of the five participants is seen in the following bar graphs during the B, A, and final B Periods. The charts demonstrate, through the use of the PCBS scores, the commonalities and differences among the students over the course of the research project. Information gleaned from the analysis of the following data provides a way in which to assess which students were impacted most and least when participating in the program.

**B Period PCBS Score Cohort Analysis**

With the conclusion of the B Period intervention, PCBS scores were gathered on all five participants. The graph in Table XLVII shows the scores each student received on November 5, 2010.
The results of PCBS scores among all of the participants, as seen in the Table ILVII, vary. The scores most definitely speak to the uniqueness of each of the participants in regard to the impact infusion of “Nature, Nurture, Knowledge” had over the B Period intervention.

Of significance are the indicators which show more uniformity in results. Notably, most of the students received positive ratings on the following PCBS indicator: *acts upon helpful criticism in such ways as: correcting mistakes, looking for other solutions; trying to better understand criticism; trying to make clear to others his reasoning*. The cohort of student participants also received similar ratings as a whole on: *uses available school time inefficiently*. Interestingly, the rating of using time inefficiently, while uniform, was low in frequency for the
students while involved in the auspices of “Nature, Nurture, Knowledge”. A third PCBS score showing consistency among all of the students was: *hands in inaccurate or inadequate written work because he does not review or check work*. Again, a low incidence of handing in inaccurate or inadequate written work seen among the students in this PCBS score may be attributed to the fact that while engaged in the outdoor, experiential, nature-based learning there were fewer written assignments.

*A Period PCBS Score Cohort Analysis*

Student participants remained indoors and experienced traditional teaching methodologies from November 8, 2010 to November 23, 2010 which was during the A Period of the research project. During the A Period, or hiatus in intervention, students engaged in typical instruction in typical settings. The staff members who most closely worked with each student over the three week period were asked to complete a PCBS score at the conclusion. Results of the cohort, as demonstrated through PCBS scores, are graphed within Table XLVIII.
As the graph above indicates, there were wide ranges in scores across all twenty-four indicators. Each student’s individual score is seen in Table XLVIII. The uniformity among several of the PCBS indicators is visible and of interest in that commonalities among the participants may offer insight into the forms of behavior and affect which are most likely to be similar among many students when not exposed to “Nature, Nurture, Knowledge”.

All of the student participants had identical scoring on two indicators: uses available school time inefficiently and tries out new things; puts ideas or things into new combinations. The scores indicate that students in the cohort share commonalities when the intervention was
removed. The variance among other indicators on the PCBS scores may, again, be attributed to the fact that the students responded differently from each other absent the intervention.

**B Period PCBS Score Cohort Analysis**

The final period of intervention (B Period) occurred from November 29, 2010 to December 17, 2010. Students were exposed to outdoor, nature-based, and experiential learning during the concluding timeframe of the research study. PCBS assessments were given at the conclusion of the final period of intervention for “Nature, Nurture, Knowledge” and similarities and differences among the cohort were noted. The bar graph in Table XLVIV provides a visual review of scores among the cohort of students and allows for the investigation of commonalities among participants.

**Table XLVIV**
A wide degree of variability is noted throughout the PCBS scores as was the case with the two previous comparisons of PCBS scores among student participants. The vast majority of scores on each indicator by student shows little pattern of consistency. Scores which did elicit similarities between students include; *uses available school time inefficiently, tries out new things; puts ideas or things into new combinations, and hands in inaccurate or inadequate written work because he does not review or check work*. The results of all of the PCBS scores shown as a cohort are interesting in that the level of individuality on the part of each student in regard to the impact of “Nature, Nurture, Knowledge”, truly emerges from the data.

The cohort data leads the reader to understand that despite unique differences among students with high intensity special education needs, the infusion of “Nature, Nurture, Knowledge” elicits several similar responses. Based upon the results found in Table XLVIV, should the intervention be administered, removed, and then re-administered and the project repeated, students would often have similar results in specific indicators.
CHAPTER V: DISCUSSION

Overview

BHMCS students enrolled in the ILC have unique academic, social, emotional, and behavioral needs. Continuing to provide the same services in the same fashion to students that present as academically and socially challenged has not ameliorated the display of poor academic achievement and unacceptable behaviors. Research has shown that experiential learning and bringing students outside and into the natural world for instruction and daily experience is beneficial. Students with a variety of challenges have grown academically, improved poor behavior, and reported positive feelings when exposed to nature-based and experiential learning opportunities outside. The question of whether or not typical students should be engaged in these types of activities has been answered with an emphatic “yes”. A different issue, and the work of this research project, is the determination of whether or not the same results may be seen in low incidence, high-intensity special education students. While the findings articulated throughout this DPR may be inconclusive, the theory and previous research surrounding the benefit of nature-based, experiential, and outdoor education is decisive. The results of piloting “Nature, Nurture, Knowledge” on a select group of youngsters has provided a wealth of data and prompts further questions. In fact, the three month period in which the project occurred will serve to provide a baseline of information by which further study may be done and improvements to implementation made. “Nature, Nurture, Knowledge” provides a
means by which public educational practices may change and the implications of this study may be viewed as a pilot, model, or best practice for BHMCS and perhaps other institutions.

Fraenkel and Wallen (2003) note that practical action research, of which this single subject design was modeled, often does not require the full-scale implementation of research techniques employed by professional researchers. Rather, the action research has a practical application and is rooted in eliciting change and employing stakeholders to become involved in the process. The doctoral project, “Nature, Nurture, Knowledge”, generated from a need to change student behaviors. The problem of practice drove the research questions and the level of involvement of stakeholders was evident. Discussion on the purpose, research questions findings, and implications of the project follow.

Purpose

The purpose of the study was to determine what impact the implementation of “Nature, Nurture, Knowledge”, a program by which students in the BHMCS ILC would be exposed to outdoor, nature-based, and experiential learning opportunities, would have on youngsters. The study sought to understand what real and perceived changes in behavioral performance might occur when students with low incidence, high-intensity special needs were exposed to the intervention, withheld from the intervention, and, finally, exposed a second time to intervention. The study served as a pilot for future instructional practice and the data collected included quantitative as well as qualitative information. The data received from administering the pilot over a three month period included quantitative data scores, qualitative personal reflections, and
qualitative interview information. All data sets were analyzed in order to ascertain what benefit students received and ultimately how “Nature, Nurture, Knowledge” might serve as a pilot or model for future inquiry.

Once granted approval to move forward with the research project by faculty of the College of Professional Studies at Northeastern University, efforts were made to enlist the support of district staff. As previously written, district leaders were amenable to the research project and gave approval for the implementation of a pilot or model of instruction with the hope of changing educational practice within the BHMCS ILC. Finally, meetings were held inclusive of the BHMCS Leadership Team and BHMCS ILC staff in order to build support for the proposed intervention and corresponding research project.

Research Questions

A significant study ensued in order to answer six research questions posed for the doctoral project. The six research questions are written below and in following paragraphs are answered. The questions are direct and pointed and are predicated on understanding the overall problem of practice.

The research project explored the following questions:

1. What impact does an outdoor, nature-based, experiential program have on the academic proficiency levels of students with significant disabilities?

2. What impact does an outdoor, nature-based, and experiential education program have on the behavior of students with high intensity special education needs?
3. To what extent do students perceive the benefit (or not) of participation in “Nature, Nurture, Knowledge” on learning and behavior?

4. To what extent do staff perceive the academic benefit (or not) of teaching science and English language arts outdoors, in a nature-based and experiential way?

5. To what extent do staff perceive the behavioral benefit (or not) of teaching science and English language arts outdoors, in a nature-based and experiential way?

6. In what ways do staff differentiate (or not) the benefits between science and English language arts when taught using outdoor, nature-based, and experiential methods?

Findings

Findings from the research project are varied. Indeed, rather than delivering clear and decisive answers to each research question, the study revealed a need to further pilot the program and utilize the model as a best practice in instruction. Unlike studies found within the literature review, the data collected from the research project prompted a desire to expand upon the program in order to answer further questions which emerged. Several concerns in regard to implementation surfaced over the study period including staff participation, use of a prescribed curriculum, and timing of institution.

Staff participation varied throughout the study. First and foremost, a change in lead teacher occurred in November 2010. Fortunately, the paraprofessionals assigned to the classroom were consistent over the course of the study. It is important to note, however, that one of the paraprofessionals became a reluctant participant in the study. While never outwardly
challenging the auspices of going outdoors and utilizing experiential, nature-based teaching strategies, a passive defiance emerged. This declining support is evidenced in staff interview data as well as personal log book accounts in which the staff member notes avoiding going outdoors frequently. It will be important, therefore, to assign staff willing and able to participate in programming such as “Nature, Nurture, Knowledge” in the future.

The use of a prescribed curriculum came into question throughout the study. Academic freedom is a hallmark of the BHMCS ILC and, in trying to be true to the mission of the program, specific lessons were not mandated. Teaching staff in the future, should “Nature, Nurture, Knowledge” be implemented again, may be more adept at infusing nature into English language arts and science lessons, if given completed lesson plans. In the spirit of creativity, a great deal of flexibility was given to staff. This, while allowing for professional creativity, may be a variable that can be avoided in future programming.

Finally, questions about the timing of applying “Nature, Nurture, Knowledge” rose from staff and students. Thoughts in regard to when students should be going outdoors to engage in nature-based and experiential learning must incorporate weather conditions and not be tied into a specific schedule. Because the study was designed to be completed by December 2010, a strict timeline was developed. Future applications of the program must allow for flexibility when students and staff are engaged in outdoor education. A nature-based program is inherently outdoors and changing weather conditions will need to be accommodated for in the future.
The BHMCS Courtyard truly is a place where outdoor, nature-based, experiential learning may occur. The large area is open to all at BHMCS. Within the Courtyard there is a small ampitheatre where direct instruction can and does occur. A large man-made pond and corresponding wetland supports fish, plants, frogs, and other aquatic life. In addition, wild mallards flock to the pond annually and have had multiple broods of ducklings. Deciduous and evergreen trees fill the area along with flowering shrubs and plants. Birds come and go and are fed seed and suet while a raised vegetable bed is available to all.

The following pages outline each of the initial research questions. The goal of answering each question has never wavered. It is important to recognize, however, that each of the five students responded differently to “Nature, Nurture, Knowledge.” Because of the varying behavioral responses to “Nurture, Nature, Knowledge” by the five students, it is difficult to determine one decisive answer to each of the questions for the entire cohort of students.

Question 1

What impact does an outdoor, nature-based, experiential program have on the academic proficiency levels of students with significant disabilities? The subjects demonstrated varying academic fluctuations both during and absent the intervention. “Nature, Nurture, Knowledge” provided the promise of change; however, the results varied among each student. In the case of the five students exposed to the intervention, the change in academic proficiency is undetermined. Students, whether exposed to nature-infused or experiential instruction, did not demonstrate significant changes in academic proficiency. The impact of “Nature, Nurture,
Knowledge” was more pronounced in Student 1, Student 5, and, to some extent, Student 3. Student 2 and Student 4 did not receive as much of an impact as the other students within the BHMCS ILC.

Question 2

What impact does an outdoor, nature-based, and experiential education program have on the behavior of students with high intensity special education needs? Over the course of the project, some of the students demonstrated improvements in behavior when given opportunities to be taught outdoors. Staff logs, as well as the data collected from PCBS assessments, document slight improvements in outward behavior. Specifically, incidences of violent and aggressive behaviors were decreased during both B Periods. The evidence of such change is found in teacher logs, PCBS data, and the anecdotal interview data from both teaching staff and students.

Question 3

To what extent do students perceive the benefit (or not) of participation in “Nature, Nurture, Knowledge” on learning and behavior? Students placed in the BHMCS ILC suffer from specific learning disabilities as well as emotional, neurological, and low-incidence disabilities. Reflective thought is often not seen in students such as those who participated in the project. Recognizing that students have minimal capacity for insight into their feelings or personal behaviors, the interview questions elicited little perspective in order to answer the third question. In some instances however, several students noted that participation in “Nature,
Nurture, Knowledge” provided a means by which he or she was able to enjoy the outdoors and move away from the confines of a typical classroom setting or the BHMCS ILC classroom. Direct quotes, as recorded by paraprofessionals working directly with the subjects, offer insight into the student’s feelings about “Nature, Nurture, Knowledge.” As noted in the data provided in previous writings, some students felt that being outdoors was a positive experience while one student felt it was a negative experience to be outdoors.

Question 4

To what extent do staff perceive the academic benefit (or not) of teaching of science and English language arts occurs outdoors, in a nature-based, and experiential way? Staff perceived “Nature, Nurture, Knowledge” to have both positive and negative academic impact on student participants as noted through qualitative data. Interview sessions with paraprofessionals who worked most closely with students during and absent the intervention revealed that staff felt the program had minimal academic impact on students. As noted in interviews, staff felt that the educational benefit of teaching outdoors in an experiential and nature-based way would be best served if a well-developed curriculum was followed. Simply being outside in the BHMCS Courtyard was viewed as a positive activity, yet staff felt the academic gains were not as pronounced as what had been hoped for. Finally, staff shared during interviews that the work of integrating science and ELA standards in a new and different way was more challenging than not which reiterated the need for a prescribed curriculum in ELA and science. Again, as noted previously, lessons learned from the first implementation of “Nature, Nurture, Knowledge” must
not be lost.

Question 5

To what extent do staff perceive the behavioral benefit (or not) of teaching science and English language arts occurs outdoors, in a nature-based and experiential way? The results of staff interviews in response to Question 5 varied. In some instances, staff felt that students were better behaved when allowed the freedom of going outside and experiencing nature-based and experiential instruction, while other students avoided the experience and, in some ways, rebelled against the intervention. Teacher log entries specifically articulate which students fared well when given opportunities to experience “Nature, Nurture, Knowledge”, and which students struggled. As was the case with previous questions, the data revealed a mixed sense of student impact.

Question 6

In what ways do staff differentiate (or not) the benefits between science and English language arts when taught using outdoor, nature-based, and experiential methods? Paraprofessional staff, in fact those charged with the implementation of instruction, struggled with question six. In some ways, the staff felt that a prescribed curriculum, whether science or English language arts, would be most beneficial. In light of the fact that teaching staff were able to integrate their own academic freedom into the curriculum, the differences between utilizing science and English language arts in an outdoor, experiential, or nature-based way were negligible.
Outside Differences

The implementation of a nature-based, outdoor education program ensures that students are taught using a wide range of pedagogical practices. First and foremost, BHMCS ILC students received instruction in the BHMCS Courtyard. The lessons were delivered in such a way as to ensure nature was infused into the content area. Lessons were not merely taught outdoors; rather, the lessons integrated facets of the environment and were experiential in nature. For example, when learning about the water cycle, the rising level of the pond within the Courtyard was utilized as a meaningful link to instruction.

The data collected during and absent the intervention of “Nature, Nurture, Knowledge” was predicated on the idea that students learn differently when content is delivered in an experiential and nature-based way in the outdoors. The research should not be misinterpreted to represent an idea or notion that simply taking students outdoors and issuing the same lessons, albeit outdoors, will generate similar results. In no way does the literature review, theoretical frame, or data collected from this three month research project suggest that merely taking students outdoors will provide positive results.

Implications of Study

The implications of conducting the research project “Nature, Nurture, Knowledge” at BHMCS over the course of three months are many. The local and broad impact of introducing a change in practice has been felt by students and staff. The students were introduced to new ways of learning English language arts and science concepts. Staff were given new opportunities to
expand teaching methodologies and develop best practices in education. The objective of the research, to answer the six defined questions, provided a means by which to evaluate a particular form of instruction and institute outdoor, nature-infused, and experiential learning for students with intense special education needs. The results of the study provide credibility to implementing a change in practice in that maladjusted behaviors and the behavior and social affect of students with low-incidence, high intensity special education needs were impacted. While the findings of Lieberman and Hoody, Sobel, Baines and Slutsky, Olson and Clough, Ferguson, Angell, and Tudor, Manzo, Martin, Brookes, Malone, Tranter, Fisher, Lord, The Federal Government, and Louv provide a true affirmation to the benefits of experiential, nature-based, and experiential learning, “Nature, Nurture, Knowledge” served to elicit more questions than answers, which is an effective way in which to bring about change in schools. The benefit of receiving instruction in a nature-based and experiential way in conjunction with the outdoors is evident. Theorists and practitioners agree that students benefit from learning by doing, being outside, and engaging in hands-on, nature-based instruction.

Local Impact

The local impact of “Nature, Nurture, Knowledge” at BHMCS and, more specifically, in the BHMCS ILC, varied from student to student. Out of the five participating students, two clearly benefited behaviorally, two remained static, and one student avoided the intervention and continued with negative behaviors. Staff, as willing participants in “Nature, Nurture, Knowledge”, demonstrated a true enthusiasm for beginning a new and challenging shift in
teaching practice. Staff engaged in the program were challenged with difficult student behaviors, changing lead teachers, and poor weather conditions as the project evolved. Yet, the value of the undertaking was never questioned. The willingness of students to participate varied (as noted in the journal entries) on a daily basis and a uniform level of engagement between subjects did not exist. Ultimately, one student did not gain the experience of going outdoors and experiencing nature-based and experiential instruction as often as other students. Because the paraprofessional assigned to him passively rejected the study, the student simply wasn’t brought outdoors and therefore missed the opportunity to participate on many occasions.

Lessons learned from the institution of “Nature, Nurture, Knowledge” were many. First and foremost, staffing levels must be consistent and personnel must be willing participants in the program. The student and staff bonds developed are important to the classroom and staff willing and able to go outdoors and utilize atypical teaching strategies is an absolute necessity. Second, the implementation of nature-based, outdoor, experiential learning must occur when weather conditions are conducive. Simply placing students outdoors, with no regard for weather, in order to meet timelines, may be a detriment to eliciting positive impact. In the future, careful planning (perhaps ensuring an indoor and outdoor lesson is crafted) must occur in order to adjust to varying weather conditions. Finally, a specific curriculum, whether scientifically based or not, must be delivered to practitioners in order to ensure a uniform delivery of instruction. Asking teaching personnel to simply take students outside and integrate experiential learning opportunities to standardized curricula does not offer the unique possibilities seen in previous
studies on experiential, nature-based, and outdoor education models as noted in the literature review. Ultimately, the local impact of “Nature, Nurture, Knowledge” is in the form of implementing a change in practice. Transformational leadership requires innovative thinking, risk-taking, and scenario planning. As Washor and Mojkowski (2006) note, there is a prevailing mental model which includes a limited vision of schools in the twenty-first century. “Nature, Nurture, Knowledge” may be a model by which change is instituted.

Broad Impact

“Nature, Nurture, Knowledge” began as a program by which the most challenged of public school children might engage in nature-based, experiential, and outdoor instruction. With multiple theorists and practitioners already proclaiming the benefits of such instruction for students, the theory behind the implementation of such programming was well rooted. Applying the knowledge and insight gathered from this research project may be generalizable as Light, Singer, and Willett (1990) posit that small-scale studies and projects can and usually are generalizable while Yin (2003), in regard to generalization states, “scientific facts are rarely based on single experiments; they are usually based on a multiple set of experiments that have replicated the same phenomenon under different conditions” (p. 10). In order for this study to be generalized to broader populations and school settings, the types of students and types of programming would need to be similar to the BHMCS ILC population. Given that the intervention has been viewed as a pilot or model for instruction, the occurrence of changing
pedagogical practices to address the needs of students and thereby incorporating a nature-based, outdoor, experiential program is highly likely.

Pilot for Future Research

The research project submitted serves as a model or pilot for future use. Transforming educational practices is a daunting task. Scholars and practitioners alike strive to implement change. Pearce (2003) notes, “To win followers, leaders must transfer more than information. They must also transmit what they see and feel so that others see and feel it” (p. 49). In recognition of how change might occur within educational communities, it is important to note that changes to “Nature, Nurture, Knowledge” must be made. Prior to instituting the practice, the information gleaned from the pilot will be utilized to make necessary changes. Changes, as previously articulated, include the securing of staff willing and able to participate, the development of solid lesson plans for use in selected content areas, and the incorporation of a flexible mindset on the part of practitioners when faced with whether to instruct outdoors or indoors.

BHMCS ILC staff are prepared to take on the challenges of implementing whole-scale changes in pedagogical practices for the 2011-2012 school year. Many lessons were learned from the research project and plans have begun to address hoped for changes in implementation. Specifically, students in the BHMCS ILC will be given opportunities for outdoor learning when able to do so. Further, staff have considered moving beyond the BHMCS Courtyard to other areas around the BHMCS campus and perhaps to more natural habitats in the surrounding areas.
Conclusion and Recommendations

Children with severe special needs in the BHMCS ILC are generally provided services through routine forms of instruction and in traditional spaces. Pedagogical practices for students with low-incidence disabilities inclusive of autism, neurological impairment, and intellectual disability are delivered in typical fashions in typical settings. Because students in the BHMCS ILC often display behaviors which are socially unacceptable and have limited academic proficiency, the institution of a nature-based, experiential, outdoor curriculum in the form of “Nature, Nurture, Knowledge”, was thought to mitigate the problem of practice.

The problem of practice, as noted throughout this DPR, included the continuance of problematic behaviors, poor academic achievement, and socially unacceptable displays on the part of students. Five students, exposed to a doctoral project approved by the faculty and staff of Northeastern University, had varying success in terms of amelioration of problematic behaviors. Each of the five students received similar treatments throughout the three month study and each responded in unique fashions. Students 1 and 5 had noticeable improvements in behavior when exposed to nature-based, outdoor, and experiential learning while data on Students 2 and 3 showed that there was little change in affect and behavior whether exposed or not to “Nature, Nurture, Knowledge” or not. Finally, Student 4 demonstrated negative behaviors and affect when asked to participate in “Nature, Nurture, Knowledge.”

Ultimately, the doctoral project served as a means to inform pedagogical practice. A change in instructional strategies for the most needy of students occurred over a three month
time period with the full support of the superintendent of schools, special education director, BHMCS Board of Trustees, and professional staff. The lessons learned are many. Instituting change, utilizing theory, practicing different teaching techniques, and integrating the knowledge of previous practitioners and scholars culminated into the findings of “Nature, Nurture, Knowledge: The Promise of Experiential Learning for children with Special Needs.”
References


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*The Behavior Analyst Today*. Volume 8, No 2. p. 196-209


Appendix A

Telephone Script

Hello,

This is Kara Peterson, Principal of the Barnstable Horace Mann Charter School. I’m calling to speak with you about a new program we will be implementing for students in Ms. Moore’s classroom.

Over the next few months, weather permitting, students will be going outside for Science and English Language Arts instruction.

As we pilot the program, students will be monitored academically as well as behaviorally and data will be collected. Our hope is that this pilot program will lead to full implementation of the program to more students at BHMCS.

If you questions, concerns, or do not want your child to participate, please call my office at 508-420-2272.

Thank you.
Dear Parent or Guardian:

Research suggests that students are more engaged, experience higher levels of interest, and ultimately have improved academic and social achievement when teaching takes place outdoors and uses elements of nature.

In an attempt to provide the best possible learning opportunities for youngsters here at BHMCS, I have asked Ms. Moore to incorporate outdoor and nature-based teaching practices this fall. Over the course of the next month or two, as weather permits, students in Ms. Moore’s classroom will be taught Science and English Language Arts content in the outdoors and in an experiential way when possible.

While the students will be learning the same subject matter and tested with the same instruments as all students in grades four and five, teaching will occur outside and be hands-on when appropriate.

I will be working closely with Ms. Moore to ascertain what impact the infusion of an outdoor, nature-based, experiential program has on your son or daughter. My hope is that your child will enjoy experiential learning opportunities, going outside, and enjoying nature. In the future I expect we will offer the experience to more children at Barnstable Horace Mann Charter School in the future.

If you have any questions or concerns, or do not want your son or daughter to be included when teaching occurs outdoors, please call me directly at 508-420-2272.

Sincerely,

Kara Peterson
Principal
Appendix C

BHMCS Grades 4 and 5 Science and English Language Curriculum Units

Grade 4 Science:
- Rocks, Minerals, and Soil
- Weather
- Plants

Grade 5 Science:
- Earth in the Solar System
- Matter and Forms of Energy
- Ecology
- Materials and Tools

Grade 4 ELA:
- Fiction and Poetry
- Nonfiction and Poetry
- Drama

Grade 5 ELA
- Genres
- Nonfiction
- Poetry and Drama
- Research
Appendix D

Staff Interview Questions

1. How do you feel that “Nature, Nurture, Knowledge” impacted the students academically?
2. What types of academic changes occurred when the students were outside, in nature, and having experiential lessons?
3. How do you feel that “Nature, Nurture, Knowledge” impacted the students behaviorally?
4. What types of behavioral changes did you observe when students participated in the program?
5. Do you feel that one subject (science of ELA) was better suited to be an outdoors, nature-based, experiential curricula?
Appendix E

Student Interview Questions

1. How do you feel that “Nature, Nurture, Knowledge” helped you learn and behave?
2. Would you share one or more ways that the program changed your learning?
3. Would you share one or more ways that the program changed your behavior?
PUPIL CLASSROOM BEHAVIOR SCALE
University of Maryland Pupil Services Project

Objectives of this Scale

It has been shown that a teacher's professional judgment of a student's behavior is one of the most useful and valid sources of information about a pupil's growth and development. Your professional training and day-to-day experiences with children in work and play, in relaxed and stressful situations, have helped sharpen your judgment. Thus we would like to take advantage of your judgment in assessing the children you teach as one way of determining the characteristics of the children in the research schools. Data from each school will be programmed into a computer for comparison of all students as a school group with others.

INSTRUCTIONS

A. The behaviors on which we would like you to rate your students are printed on the attached pages. The number preceding each behavior corresponds to the number on the answer sheet.

B. This research is primarily concerned with the characteristics of groups of children in the schools. Therefore, give your best judgment of each child on the basis of the experience you have had with him or her, however much it has been, without spending too much time worrying about whether your response is exactly right. Few professional persons, no matter how well trained, can make ratings of others with absolute certainty and complete comfort. The fact that you may have inadvertently made an error with one child, or on further analysis and consideration might rate a few slightly differently, will not have much effect on computation for all the children taken together.

C. Please look at the enclosed answer sheets. Notice that there is space to rate 4 pupils on each answer sheet. At the top of each answer sheet there are spaces to mark your Teacher Number. If your Teacher Number were "1258" you would mark as follows:

<table>
<thead>
<tr>
<th>Teacher Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1258</td>
</tr>
</tbody>
</table>

D. There is also a space to write the pupil identification number of each pupil you rate. Four rows are shown on the answer sheet for the Student Number. Please write the pupil's number from top to bottom in the boxes as shown below. Then blacken in the corresponding spaces as shown in the following examples.

<table>
<thead>
<tr>
<th>Pupil No. 0301</th>
</tr>
</thead>
<tbody>
<tr>
<td>0301</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0301</td>
</tr>
</tbody>
</table>
BEHAVIORS:

1. Comments on the work of other pupils by bringing out good points or suggesting improvements instead of being critical of their weaknesses and faults.

2. Contributes in ways that make class activities more interesting, varied and meaningful. (For example: brings in materials; relates personal experiences to activities; suggests ideas, plans, projects, solutions).

3. Acts upon helpful criticism in such ways as: correcting mistake; looking for other solutions; trying to better understand criticism; trying to make clear to others his reasoning.

4. Shows enthusiasm toward learning activities, being with classmates and, in general, being in school.

5. Cooperates with teacher requests for quiet, for starting work and for changing activities.

6. Blows up, becomes excited, and loses self-control when unable to do what he wants to do.

7. Uses available school time inefficiently.

8. Shows little concern for the needs, problems and feelings of others.

9. Tries out new things; puts ideas or things into new combinations. (Creativity may be seen in any subject matter area, in social, athletic, manual and fine arts areas. Examples are: the making up of a poem, art object, melody, story, chart, diagram, model, a solution to a social problem, a new football play).

10. Leads well toward socially desirable goals when given the chance to do so.

11. Follows well toward socially desirable goals when given the chance to do so.

12. Gives up when faced with a difficulty without trying to find a solution.

13. Hands in inaccurate or inadequate written work because he does not review or check work.

14. Has difficulty following teacher directions or instructions.

15. Is unable to keep attention for the necessary time on work tasks.

16. Disobeys or rebels against reasonable school authority (teachers, rules, regulations).

17. Gets into fights or quarrels with other pupils.

18. Has to be coaxed or forced to work or play with others.

19. Has difficulty in learning school subjects.

20. Makes unusual or inappropriate responses during normal school activities.

21. Works extremely hard in learning school subjects to the exclusion of any other interests or activities.

22. Behaves in ways which are dangerous to self or others.

23. Is unhappy or depressed.

24. Becomes upset or sick when faced with a difficult school problem or situation.
Pupil No. 5019

<table>
<thead>
<tr>
<th>Student Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

E. Beginning with the first pupil on your class list rate this pupil on each behavior using the scale printed below:

1. almost never or never
2. not very often
3. sometimes
4. quite often
5. most of the time

F. After you have rated the first pupil on each behavior, then rate the next until all have been rated.