

Benefits of Outdoor Learning for Students: Grades, Attention, ADHD/ADD, & Behavior

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Abstract

This study examines the physical and physiological influences of outdoor learning on students. A majority of my research is based on studies and research done by others that assess the benefits of nature exposure on students' standardized test scores, attention, behavior, and overall student achievement. Through the use of an 18-question survey research was collected and data were examined in order to determine whether or not students felt satisfied or dissatisfied with outdoor classrooms. They were being assessed to see if they had different attitudes towards outdoor classrooms than indoor classrooms. The findings of this study are discussed in relation to the additional research found below.

Keywords: Outdoor classrooms, Outdoor learning, benefits of outdoor learning on attention, behavior, grades, etc.

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Introduction

Outdoor classrooms have been shown to be effective learning resources for students. At the beginning of Covid-19, schools began to find alternate ways of having classes. A solution used centuries ago worked again. In the early 1900s, tuberculosis was a common threat to get, especially in children. Two Rhode Island doctors suggested the idea of outdoor classrooms. 8 years later they opened a school and not another child got sick. More outdoor classrooms surged, however, they faded after World War II. “A century ago, schools around the world used outdoor learning, and it’s a time-tested solution that we thought would work today,” says initiative co-founder Sharon Danks, CEO of Green Schoolyards America (Bauld, 2021).

Similarly, outdoor classrooms have been coming back since the start of covid. Many schools have been moving classrooms outdoors to slow the spread of sickness, and many schools have been able to remain open through part of the outbreak as a result. Furthermore, as we move past the worst of Covid, outdoor classrooms may be here to stay. The benefits of learning in an outdoor space have been shown to teach most of the essential activities children must learn, such as exploration, risk-taking, motor development skills, and the basic absorption of knowledge. Not only is outdoor learning beneficial for basic skills, it has also been shown to help some students with learning disorders such as ADHD/ADD. Outdoor learning can help with students' behavior, attention, grades, and even their attitudes towards school while allowing for physical activity, connecting us with nature, and setting social skills in learning children.

Importance of the study

It's becoming known that some kids are becoming overwhelmed in traditional indoor classroom environments. ADHD, anxiety problems, behavioral problems, and depression are the most commonly diagnosed mental disorders in children aged 3-17 (Dennis, Kiewra, Wells, 2019).

Commonly, these conditions occur together and have increased over time. “About 6 million (9.8%) have been diagnosed with ADHD, 5.8 million (9.4%) have been diagnosed with anxiety, 5.5 million (8.9%) have been diagnosed with behavior problems (Centers for Disease Control and Prevention, 2022). In outdoor classrooms, kids are able to actively make their own decisions instead of simply following what other kids are doing. They are becoming ambitious and excited to explore the different challenges outdoor classrooms have to offer. Outdoor learning includes all learning styles and curriculums, making it easier for students of all levels to actively participate. It makes learning much more tangible for the kids and could provide good resources for science classes. Outdoor classrooms can help with students' behavior and grades while allowing for physical activity.

Objectives

The purpose of this research is to collect and analyze information on the benefits of outdoor learning and compare it with statistics, studies, and results done by others.

Literature Review

The source used was *Natural Outdoor Classrooms: A National Survey*. The goal of the project was to conduct a survey with educators and administrators who work with the children in natural outdoor classrooms to examine educators' observations related to supporting children's social, emotional, cognitive, and physical development.

A survey conducted by the University of Wisconsin survey center was administered in 2015 with a total of 274 potential sites including natural outdoor classrooms in 39 US states. Respondents were about 49% teachers only, while 29% were administrators and teachers, and 21% were administrators only. 88% of educators said they were able to observe children's interests and needs in their outdoor classroom often or very often. Additionally, 94% of teachers reported that they observe children engage in expressing ideas and choices often or very often in the natural outdoor classroom. This means that children are consistently thinking creatively when they are in an outdoor learning environment. Additionally, this research also showed benefits for children with differing/special needs. Most educators (76%) answered at the high end, stating that they felt children with special needs showed increased engagement in outdoor classes than indoors. Additionally, teachers who worked for longer periods of time with the kids were more likely to report this. Overall, these findings indicate a link between nature exposure and positive outdoor-based learning and developmental outcomes such as enhanced imagination, and mental, and physical wellbeing (Dennis, Kiewra, Wells, 2019).

Research Question

Do students benefit in a mental, physical, academic, social, or behavioral way from outdoor learning?

Ho: There will be no benefit between grades, attention, and behavior for students who undergo outdoor learning.

H1: There will be positive impacts of outdoor learning on students' attention, grades, and behavior.

Hypothesis

After collecting and analyzing the data, the goal was to test if the results were similar to what was expected. The hypothesis was that most students would enjoy outdoor learning more as opposed to indoor learning. The second hypothesis was, that attention would be better focused during outdoor learning than indoor learning. The third hypothesis was that students would increase their grades, attention, and behavior with exposure to nature. The fourth hypothesis was that outdoor learning benefits children with learning disorders and different learning styles.

Methodology***Participants***

My survey consisted of 57 respondents. 45% were seniors, 19% were junior, 15.5% were sophomores, 8.6% were freshmen, 6% identified as other, and 3.4% percent were teachers. Participants were collected using convenience sampling, additionally, they were asked whether or not they have taken an outdoor-based class this semester, and only 22.4% said they are. However, 76% have taken an outdoor-based class in the past while 15.5% have not.

Procedures

Participants completed an 18-question survey on google forms containing questions contributing to the main research for the study. Each of the questions is composed to allow responses for the following categories which were used to determine the statistical evidence on theories and the overall objectives: satisfaction with classrooms, comparing indoor vs. outdoor classrooms, learning styles, social skills, physical activity, and academic success.

This experiment is to back up other researchers in regards to how outdoor classrooms affect learning, behavior, attention, and academic success. Questions on the survey were asked in regard to behaviors and attitudes in outdoor classroom settings were assessed. Quantitative data was performed to determine how satisfied students were with outdoor classrooms as opposed to indoor classrooms. The pros and cons of students' learning, attention, and grades were also taken into account. For gathering the data, I created a short questionnaire asking students about their satisfaction with outdoor classrooms. The participants are part of a research project where they were asked to fill out a short 18-question survey. Each participant was also asked questions based on their demographics and previous knowledge of outdoor classrooms. To gain validity, some questions were asked twice with different wording. This allows for more accurate and meaningful results as essentially these questions are asking the same things. The completed surveys and notes will be directed back and be analyzed from there. After all the data is collected, based on the results there will be a better understanding of how outdoor classrooms impact students of Paul Smiths College as well as how it compares to the online research.

Materials

Participants completed a survey through google forms containing questions contributing to the main research for the study. Each of the questions is composed to allow responses for the following categories which were used to determine the statistical evidence on theories and the overall objectives: satisfaction with classrooms, comparing indoor vs. outdoor classrooms, learning styles, social skills, physical activity, and academic success. The survey was filled out through paper copies as well as filled out digitally through the computer.

Results

Attention

Results on attention showed positive impacts from being outdoors. Outdoor learning is considered to be hands-on learning and it can help with visual, auditory, and tactile skills, thus improving students' knowledge retention and attention. The impact of attention in outdoor learning on future classroom participation was studied in a 300-student environmental magnet school in the Midwest that serves a largely underprivileged population, with 87 percent of students qualifying for free or reduced lunch. The average student rating of class engagement was around 80 percent on a scale of 0 to 100 percent, with little variation.

Additionally, redirects/distractions were less common after a nature lesson—in fact, the number of distractions after a nature session was around half (54%) of that of redirects or distractions following classroom instruction. When children are exposed to the outdoors prior to an indoor classroom, the benefits may be almost as valid as actually being outside. The nature setting had a distraction rate of about one distraction per 6.5 minutes, whereas the indoor classroom condition had one interruption of instruction every 3.5 minutes (Kuo, Browning, Penner, 2018). This is interesting because it suggests that the benefits on attention, grades, and behavior will last even after children have returned inside. This can benefit students who may suffer with attention problems in outdoor classrooms, allowing them to learn indoors where they are comfortable, but also receive the benefits that the outdoors has to offer.

Grades

The impact of attention in outdoor learning on future classroom participation was studied in a 300-student environmental magnet school in the Midwest that serves a largely underprivileged population, with 87 percent of students qualifying for free or reduced lunch. The average student rating of class engagement was around 80 percent on a scale of 0 to 100 percent, with little variation. Increased standardized test scores, improved attitude toward school, improved in-school behavior, higher attendance, and overall improved student accomplishment have all been documented when students learn in and about nature, according to research. (Kuo, Browning, Penner, 2018). Another study with 255 students spread over four primary schools held an outdoor education program implemented for one set of kids, with a control group serving as a comparison. Children who attended outdoor school improved their test results by 27%, according to the study. Additionally, in the areas of self-esteem, conflict resolution, peer relationships, problem-solving, willingness to study, and classroom behavior, students who participated in the program obtained much higher scores than those who did not. (Stable Copmany, 2017). Furthermore, outdoor education efficiently utilizes a wider variety of intelligence in children. Many researchers attribute the improvement in performance to the greater relevance and hands-on experience that comes with learning outside (Bell, & Dymont 2006).

Health & Stress

Significant levels of ongoing stress—“toxic stress,” can dramatically affect young people’s brains. Nature exposure has immediate, positive benefits on attention and stress, and is likely to boost motivation as well. Self-discipline and impulse control has been demonstrated to improve when people spend more time in nature (e.g., Faber Taylor et al., 2002; van den Berg and van den Berg, 2011). When children are subjected to frequent, continuing stressors during

their first few years of life, when their brains are still developing, the effects can be long-lasting, even leading to changes in the brain's structure and the body's ability to control stress McEwen, (2011). High levels of the stress hormone cortisol may be poured into children who have been neglected or who are dealing with a parent's mental illness. Their cortisol levels will remain elevated unless they have supportive caregivers who can address their needs and assist them to manage their emotions. This can lead to problems with executive functioning and decision-making, scholastic difficulties, and behavioral disorders, as well as a greater incidence of health conditions including heart disease and depression in adulthood.

Multiple research with children has linked exposure to nature to lower levels of both self-reported and physiological indicators of stress (Bell and Dymont, 2008; Chawla, 2015; Wiens et al., 2016). Furthermore, students who spent one day a week learning in a forest setting had healthier control of the stress hormone cortisol than a control group who did not undergo outdoor learning.

ADHD/ADD

Additionally, my research studies whether or not outdoor environmental impacts would positively impact students with learning disorders such as ADHD/ADD. My research found that chronic nature exposure significantly reduced ADHD symptoms over time such as tension and anxiety. STATS. Over the years, there has been a global increase in the diagnosis of behavioral disorders, including ADHD (Conrad & Bergey, 2014). Traditional classrooms have suited some children however it alienates others, leading to disruptive behavior, tardiness, distractions, ect. The natural environment has been proven to improve children's behavior and attention while

allowing the student to feel calmer. Children and teens between the ages of five and 18 exhibited a significant reduction in ADHD symptoms after being exposed to nature, according to a study published in *Applied Psychology: Health and Well-Being*. Subjects in this study had reduced tension, and anxiety, and were better able to follow directions, regardless of their age, gender, location, or intensity of symptoms. In addition, the study found that the long-term impacts of "chronic nature exposure" decreased ADHD symptoms and improved school performance significantly. Other Neurotypical students have had improvements in mental health and emotional regulation after spending time outdoors. This increase in mental health stability could cause students to be better behaved, stay focused, and have a better ability to return to school each day (Gill 2014).

The University of Illinois found a natural setting can reduce attention deficit symptoms in children (Barlow, 2004). 400 students with ADHD and ADD across the United States and from different backgrounds were assessed if "green time" has a significant impact on their symptoms. "Results showed "classroom-based physical activity had a positive effect on improving on-task and reducing off-task classroom behavior (standardized mean difference = 0.60. (Kuo, Browning, Penner, 2001).

$F(1, 651) = 4.61, p 0.05$, was shown to be a significant condition x gender interaction effect. The source of this interaction appears to be boys' comparatively high on-task behavior ratings following the outdoor play treatment, compared to girls.

It also led to improvements in academic achievement when a progress monitoring tool was used (standardized mean difference = 1.03. However, no effect was found for cognitive functions (standardized mean difference = 0.33 or physical activity (standardized mean difference = 0.40."

(Watson, Timperio, Brown, 2017). Outdoor classrooms are good for de-stressing students and keeping them engaged and consistently coming to class. Additionally, The majority of students prefer outdoor classrooms as opposed to indoor classrooms. Students also reported preferences in their classrooms, for example, the most common preference was access to options in the classroom. Having access to different options in the classroom can allow for creativity and growth in students' social skills, tactile skills, auditory skills, creativity skills, and more.

Social Skills

This form of play is also a great way for kids to learn how to deal with risk-taking in a social setting and to develop a sense of self. It teaches kids how to make social judgments for themselves, build confidence, and recognize their own talents and capabilities.

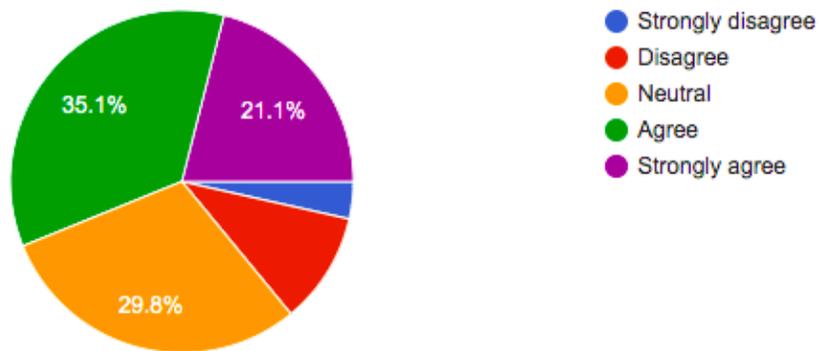
Interaction with peers is an essential aspect of a child's growth. Outdoor learning can encourage collaboration and cooperation, teach kids how to get along with others, and show that everyone has something significant to offer. It is also helping kids connect with their outgroups, teaching them acceptance of all people. According to Kahn (1997), infants can acquire empathy for both nature and humans, and empathy in one area can extend to another. This theory proposes that when children display prosocial actions like care and empathy toward animals and plants, their comprehension of people's viewpoints, needs, and feelings might improve as well. When kids can envision themselves in the shoes of a friend, their perspective-taking skills may become generalized, allowing them to grasp concepts with more ease. When students are learning outside, it reduces the need for confrontation in students and highlights helpfulness and independence (Khan, Bell, 2020). Outdoor play at this age can also give chances for role-playing, which fosters imagination and improves empathy. Children can play out the roles of people or animals they have seen or read about in books or on television. This type of inquiry

boosts their creativity while also improving their emotional awareness and intellect. Unstructured or rather loosely structured outdoor play is known to be the best. This is also known as free play. This implies that students are encouraged to come up with their own ideas for what they want to accomplish, allowing their imaginations to run wild. It is frequently played with more than two people and enables youngsters to utilize their social skills while determining how to play together. “When kids advance to older grades, they are forced to sit at a desk, learn about topics that don’t necessarily interest them, and then take multiple-choice tests that almost pigeon-hole them into a predetermined way of thinking” (Stein, 2017). Mutual play among peers promotes perspective-taking and empathy for others, which serve as a foundation for building and keeping friendships throughout a child's life (Brown, 2009). Children, in particular, acquire information experientially, via play, experimentation, exploration, and discovery, according to studies on how young people learn.

Discussion

Figure 1.

My attention is more focused during my outdoor classes than in my indoor classrooms
57 responses

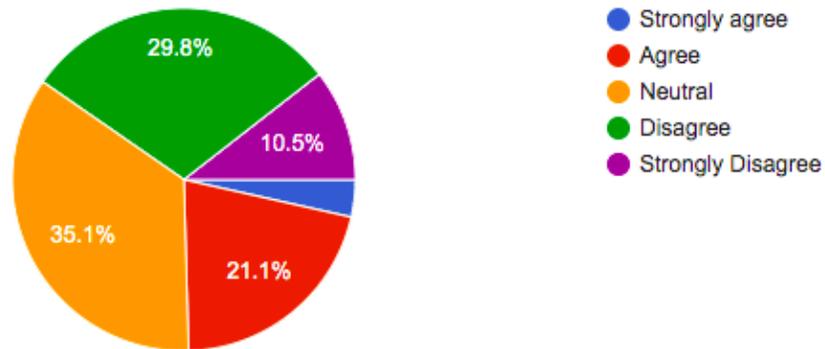


This question asks students if their attention is more focused in outdoor classrooms than indoor classrooms. Over half of the students agreed. 35% agreed and 21.1% strongly agreed. Only 6/57 people disagreed and 2 strongly disagreed.

Figure 2.

My attention is more focused in my indoor classrooms than in my outdoor classrooms

57 responses



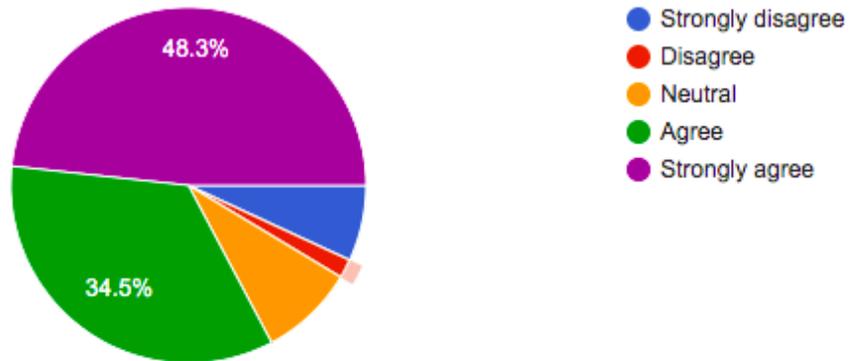
This question asks students think their attention is more focused during indoor classrooms than outdoor classrooms. This question was similar to the question and Figure 1. The reason for this was to compare the data between the two questions for more valid answers. About 40% disagreed and 35% were neutral; only 21% thought that indoor classrooms help their attention more than outdoor classrooms. When comparing these two questions, it seems as though many people's opinions remained consistent throughout the differently phrased questions. I also asked students open-ended questions to get some qualitative data. I asked students a vague questions and provided a place for students to discuss their opinions on outdoor classrooms/learning. A total of 38 students responded. Many of the responses from students described high satisfaction with outdoor classrooms. A majority of responses said they want more or they love them. Some more interesting responses were that it takes commitment to keep the outer classrooms in good condition. Some students mentioned wanting better-designed outdoor classrooms on campus like the one behind Cantwell. Additionally, the weather here at Paul Smiths is unpredictable at times

and often harsh, leading to a lack of use and maintenance of outdoor classrooms. One student reported the outdoors being distracting because of their ADHD however an ideal circumstance would be when they are outside and able to focus. Others said depending on the subject or class they enjoy outdoor classrooms, for example, art or lab. Many students like the idea of having an outdoor classroom as they think it's a good learning tool. Many students reported wanting more classrooms like the one behind Cantwell. An ideal outdoor space would often have a range of items for children to utilize, such as huts, outdoor furniture, or water features. By infusing kids' imaginations into learning how to utilize these resources, it encourages kids to play more creatively. This can also help teach kids to learn about risk-taking and problem-solving while still having fun.

Figure 3.

I feel happy when I find out I'm going outside for class

58 responses



Implications

Initially, there were problems with my first survey, as I was having software issues. I eventually decided to switch to using Google forms where I created a new survey and added additional questions. The survey was given out to students and teachers at Paul Smiths College who have had experience in outdoor classrooms.

Appendix:

I am...

- a. Freshmen
- b. Sophomore
- c. Junior
- d. Senior
- e. Other
- f. Teacher

I believe the outdoors has many benefits and I try to be out in nature every day

- a. Strongly Disagree
- b. Disagree
- c. Neutral

- d. Agree
- e. Strongly Agree

I have taken an outdoor-based class in the past

- a. Yes
- b. No

I have taken an outdoor-based class this semester

- a. Yes
- b. No

Describe your satisfaction with outdoor classrooms

- a. Very satisfied
- b. Satisfied
- c. Neutral
- d. Dissatisfied
- e. Very dissatisfied

I feel happy when I find out I'm going outside for class.

- a. Strongly Disagree
- b. Strongly disagree
- c. Disagree
- d. Neutral
- e. Agree
- f. Strongly Agree

Outdoor classrooms help me stay focused.

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

Describe your satisfaction with indoor classrooms.

Very satisfied

- a. Satisfied
- b. Neutral
- c. Dissatisfied
- d. Very dissatisfied

Outdoor classrooms help me stay focused more than an indoor class.

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree

- e. Strongly Agree

The benefits outweigh the cons in indoor classrooms

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

My attention is more focused during my outdoor classes than in my indoor classrooms

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

I think I enjoy outdoor classrooms more than my peers

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I think I enjoy outdoor classrooms less than my peers

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

My attention is more focused in my indoor classrooms than in my outdoor classrooms

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I feel more creative when I'm outside

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I feel that outdoor learning fits my personal learning style

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

Open-Ended: Describe your stance on outdoor classrooms.

Conclusion

Overall, there is a magnitude of benefits for having more classroom settings outdoor, these are just some of the most researched topics. More research should go into the differences between learning outdoors vs. outdoor classrooms and if there is any association between differences in attention, behavior, etc. On the other hand, most of the research remained consistent throughout different sources stating that outdoor learning is beneficial for students' basic skills and academic success. With the most promising positive result being behavior, social skills, and letter grade. Outdoor learning has been proven to significantly support children's wellness and should become a key part of children's schools. With many participants in high demand for outdoor learning, it seems to be a perfect time to incorporate an outdoor classroom onto our Campus.

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