

10-15-2024

## Outdoor Educational Opportunities and Movement Breaks Effect on Mental, Social, Emotional Health of Adolescents

Nathaniel Ballard

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**Outdoor Educational Opportunities and Movement Breaks Effect on Mental, Social  
Emotional Health of Adolescents**

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Master of Arts in Education – Educational Leadership

ED 590: Research and Completing the Capstone

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October 12, 2024

## **DEDICATION**

To my wife: Thank you for choosing to walk each step of this journey with me. It has already been an adventure together, but I am so proud of you and our accomplishment of getting to this point. I could not ask for a better partner in this thing called life.

To my daughter, Hazel Grace: You have brought so much joy into our lives. You bring a smile to our face every single day. Thank you for supporting your momma and dad on this journey. God knew we needed you!

To my parents: Thank you for supporting me along every step and teaching me the skills I need. Thanks for teaching me how to write. You have challenged me to be the best I can be and to love others and our God with all we have.

To my family: The support from each of my siblings and my in-laws has brought the peace and comfort to knowing I can do this!

To my grandma: Thank you for demonstrating a passion for education and for showing me to love the adventure along the way.

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### **Abstract**

This paper examined research intent on the purpose of studying how educational leaders may support the mental, social, and emotional health of adolescents through incorporating outdoor educational opportunities and movement breaks in the classroom. The qualitative, quantitative, and mixed method approaches used, delve into the ways of incorporating movement in the classroom through brain breaks, utilizing outdoor education opportunities, and the effects technology can have. These concepts and tools can work together to support the mental, social, and emotional health of adolescents as well as to promote greater academic growth. However, they must be utilized appropriately for intended success. The studies analyze the needed incorporation of movement breaks, as a way to give the brain time to process the content appropriately, decrease time spent sedentary, and increase focus and on-task behavior. The research also analyzed how the incorporation of outdoor education allows for hands-on experiences, increased social connections, and greater time spent outdoors. As it relates to time spent outdoors, research does caution the use of technology in connection to reducing green time. If overused or used inappropriately, technology can have a negative effect on the mental, social, and emotional health of adolescents. Educators must work together to support students. This includes the proper implementation of movement in the classroom, outdoor education, and appropriate technology usage.

*Keywords:* brain breaks, movement, outdoor education, nature-based learning, technology, and mental health.

## Outdoor Educational Opportunities and Movement Breaks Effect on Mental, Social, and Emotional Health of Adolescents

### **Chapter One: Introduction**

If you were to close your eyes and think of a place or a surrounding that brought you some peace and reduced stress, you may think about a setting such as being in the woods, at the beach, or on top of a mountain. You may find as you walk through the woods or submerge yourself in nature, you find yourself in a state of peace, tranquility, and even curiosity about the world around you. Your stress levels may decrease yielding more sleep, brain activity, and cognitive function. This place you picture may be one of many settings existing in the natural world. The opportunities awaiting to encounter activity surrounded by outdoor experiences are endless. Opportunities that can be healing for the mental, social, and emotional health of young adolescents, while also yielding brain activity which can spark curiosity. According to Jimenez et al. (2021), “Green spaces provide children with opportunities such as discovery, creativity, risk taking, mastery, and control, which positively influence different aspects of brain development...nature may affect health, including but not limited to increasing opportunities for social engagement” (pp. 1-2). Time spent outdoors yields these many benefits, while also seeing an increase in academic achievement, hands-on experiences, and overall engagement.

Now imagine yourself in the classroom. Think of the space you are immersed in. The teacher calls everyone together for the learning lesson. You sit as the teacher spends time presenting the day’s lesson and then shares the directions for the work to be done. You sit at your table or desk and work on your assignment. Your body is going numb for the chance to get up and move, to explore, or even a chance to connect about the learning with another member of the class. In more recent years, this second picture is, unfortunately, becoming a more common

trend. The push for curriculum has students finding less time to explore in a more natural setting, yet rather, sitting in a classroom during learning time and heading straight to work time. There is a shift for more assessment and direct instruction, creating a goal of high testing scores. Zosh et al. (2017) write “At a policy and practice level, recent decades have seen a push for children to learn academic skills at ever younger ages” (p.28). At such an essential age to explore, particularly outside, this push can be detrimental. If you could picture one last image and imagine we combine this push of learning in academic success into a setting where we have the ability to move around, explore, and increase brain activity, think about the learning that could be accomplished. Imagine if we could set our students into a place where stress levels are reduced, they are excited about what they are learning, their curiosity is encouraged, and they have the chance to engage with this in a hands-on way. Think of the ultimate success not only in academics, but also on the mental, social, and emotional health of adolescents.

### **Importance of the Topic**

Within such a natural growing age of education, technology, and curiosity for the world, exists a great need to support adolescents’ mental health, learning, and experiences both in and out of the classroom. As children grow, they develop emotions, questions, fears, and stress negatively affecting their mental, social, and emotional health. Without the proper support, engagement, and teaching of these developments, these adolescents risk a lack of social skills, poor emotional regulation, and an unstable mental health. One way of supporting adolescents is through encouraging the implementation of spending time outside as “Spending time in nature is linked to both cognitive benefits and improvements in mood, mental health, and emotional well-being” (Weir, 2020, p. 50). An environment in which students are encouraged to be curious, investigate, and be challenged to work as a team, will aid in this healthy development of

adolescents. Participating in nature-based learning, providing authentic opportunities to learn beyond the classroom space, while also remaining physically active are invaluable experiences educators should be providing. Our experiences and the setting in which we immerse ourselves in, creates within our brain the healthy cognitive development we need to learn. “We found evidence for associations between nature exposure and improved cognitive function, brain activity, blood pressure, mental health, physical activity, and sleep” (Jimenez et al., 2021). Unfortunately, there is a declining trend in the amount of time children are spending exploring the great outdoors. According to Torquati (2010), “For many children, outdoor exploration, which once was a universal, everyday experience, has become rare and now requires explicit and purposeful adult planning” (p. 99). Technology may have a part to play in this. Charan et al. (2024) present “Over the past few decades, there has been a significant decline in children’s outdoor play. Several factors contribute to this shift, including the rise of technology...digital entertainment has drawn children indoors, captivating their attention for hours on end” (p. 12). In order to help positively impact student development and learning, we must provide students with outdoor educational opportunities, movement breaks, and be careful not to overuse technology. The following research presents how providing these students with these important topics of discussion, movement, outdoor educational opportunities, and technology limits, can ultimately make a significant, positive impact.

### **Scope of the Research**

The research conducted examines qualitative, quantitative, and mixed study approaches with the intended focus being on how the opportunity to move, be creative, and explore both in and out of the classroom supports mental health, social awareness, and increased brain development. Researchers also reviewed the use of technology as it relates to mental health and



decreased time spent outdoors. The literature review follows three themes from research regarding movement, outdoor education, and technology in relation to mental health. The first theme reviews the implementation of brain breaks as a method of incorporating movement. This theme reveals the positive effects from movement as a strategy for improving focus, allowing time for the brain to digest the learning, and increasing mental health. The second theme describes how findings on studies focused on outdoor education reveals positive effects on academics and mental, social, and emotional health of adolescents. The studies track the positive reflections shared from students who have experienced outdoor education. The third and final theme reviews the use of technology as a tool that can be a positive or negative, depending on how it is implemented and if it is used appropriately. Research specifically focused on children and adolescents, and not ages in the college levels. The studies were extended past the United States and included many countries. Research was not investigated on specific types of schools such as charter, public, or private. The methods and tools analyzed from these studies, may be included within any school setting.

### **Research Question**

In light of what is known about pedagogy in the contemporary educational setting, how do outdoor educational opportunities and movement in the classroom affect the mental, social, and emotional health of adolescents? In most schools there are clear expectations set for the curriculum and what test scores should be achieved. However, in thinking about connecting to Concordia University, St. Paul's Educational Leadership Program's Essential Question: "In light of what is known about pedagogy in the contemporary educational setting, how shall educators lead equitably and inclusively in order to positively impact student development and learning?" it is also important to think of what should be done to prepare students for success both in

academics and in the success of their mental, social, and emotional health as well. Though explicit instruction is a key component to the job of an educator, one must not forget the vital component of supporting their brain development through the act of movement, both in and out of the classroom. Supporting their learning by immersing students in a setting that encourages creativity, exploration, and challenges them to work together, will not only be supporting them by being the educational leader they need, but will also positively impact their development and level of learning.

### **Definition of Terms**

***Adolescence*** is a developmental stage during which biological (e.g., hormones) and social-environmental changes happen together with the maturation of cognitive capacities (Camerini et al., 2022).

***Mental Health*** can be defined as a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community (Camerini et al., 2022).

***Brain Breaks*** are short bouts of physical activity without educational content, which take place inside a classroom (Stryk et al., 2023).

***Nature-based learning*** is learning and teaching, using inside or outside of the classroom which encapsulates a wide variety of activities from using a natural area as an outdoor classroom to using sticks for measurement in mathematics. Nature-based activities all focus on nature as a tool for learning across the curriculum rather than as the subject about which students are learning (Miller et al., 2021).

*Nature Deficit Disorder* is a nonclinical term describing the potential impact on the well-being of youth with concern about chronic human health issues due to less frequent interaction with the natural world (Warber et al., 2015).

*Problem Technology* is a behavioral problem defined by being overly worried about technology use, driven by an uncontrollable urge to use it, and devoting so much time and effort to technology that it impairs other important life areas (Sampasa-Kanyinga et al., 2022).

### **Summary**

It can be a great challenge as educators to equitably lead students into success both in academics and social emotional health. This is especially difficult in a setting where students are feeling overwhelmed, bored, or not supported in their need to move and be curious. When taking steps to support these students, it is important to be aware of the strategies and opportunities available to support them. The method of one size fits all or what works for some, will work for all, is not a supportive or healthy view. There is a great need for students to be challenged to act on their instincts, be hands-on, and explore the world around them. Throughout the research in this paper, many studies are found supporting the implementation of movement and outdoor opportunities, while also reducing hindering factors such as technology, which support this great need of exploration, social connections, and physical activity.

## **Chapter Two: Literature Review**

There has been research done in numerous countries for years on the effect movement and outdoor education has on the health of students mentally, emotionally, socially, and academically. The positives of such needed experiences have grown, particularly in the past few years, with such a rapid decline in mental stability and social skills post-pandemic. There have been many attempts to provide students with different types of movement breaks and outdoor experiences. However, situations differ from school to school, location to location. Outdoor opportunities may not be as readily available for some due to factors such as economic status, geographical location, or focus on academic structure versus outdoor experiences. However, it is vital these opportunities are provided. The literature analyzed within this paper ties three major themes together connecting to the research question of how movement in the classroom and outdoor educational opportunities affect the mental, social, and emotional health of adolescents. The first theme analyzes the importance of incorporating movement within the classroom through brain breaks. The second theme views the vital role outdoor education and hands-on experiences has not only on academics, but also on the mental, social, and emotional health of adolescents. The third and final theme gives insight and caution into the incorporation of technology. If not modeled and implemented appropriately, technology can have a negative effect.

The first theme involves five studies by Savina et al. (2016), Perera et al. (2015), Stryk et al. (2023), Kariippanon (2021), and McMullen et al. (2014). These studies researched different benefits of brain breaks and movement in the classroom. The authors found overall, movement in the classroom benefits the social, emotional, and mental health of students by providing physical activity, whether through DVD's or through teacher created breaks. These breaks also allow for

the brain to have time to process effectively the learning taking place. However, in order for benefits to be fully successful, they must be implemented and modeled effectively.

The second theme involves five studies by Mutz et al. (2019), Sobel (2020), James and Williams (2017), White (2007), Miller et al. (2021), and Fiskum and Jacobsen (2012). These studies researched different benefits outdoor education can have. Each study, unique in its design, conclude nature-based learning creates opportunity to engage in a world that challenges learning and engagement in a way to promote greater depth of understanding. These opportunities can promote higher levels of academics, strong mental health, and promote greater social connections.

The third theme involves studies by Camerini et al. (2022), Nielson and Arvidsen (2021), Warber et. al (2015), and Sampasa-Kanyinga et al. (2022). The research analyzed reveals the importance of appropriately utilizing technology without overuse. Studies found it can be a tool for great learning, however, can quickly become harmful, particularly on the mental, social, and emotional health of adolescents. It can create increased time remaining sedentary, while also decreasing time spent outdoors.

### **Brain Breaks**

When processing how to positively improve the mental, social, and emotional health of adolescents, one may consider the ability for students to have the needed movement in classrooms. One way of incorporating movement in the classroom is through different types of brain breaks and movement activities. An academic study completed by Savina et al. (2016) synthesizes studies on the benefits of movement for adolescents. Savina et al. (2016) analyzed results of different research studies and surveys pertaining to the topic of physical activity of children and the evidence they point to in improving youth's physical and mental health,

learning, executive functioning, memory, on-task behavior, and academic performance. This particular academic study limits its focus to the elementary level. It does not analyze the studies of research on students in the high school levels. This specific age focus yields a limitation in missing the positive data that comes from analyzing how brain breaks can effect multiple age groups. However, within this limitation, Savina et al. (2016) do present some data that makes a quick mention to the upper grades:

Since the passage of the No Child Left Behind act in 2001, 44% of elementary schools in the USA have reduced physical education and recess time. Further, only 3.8% of elementary school, 7.9% of middle school, and 2.1% of high school students in the USA receive formal physical education for the entire school year. (p. 282)

This reduction in physical activity yields a negative effect, not only on the physical health of children, but also on their cognitive development, academic performance, and emotional well-being. Savina et al. (2016) state “Physical activity is positively associated with youth emotional well-being...73 studies found that physical activity had a small but significant effect on children’s mental health. More specifically, physical exercise can reduce stress, depression, and anxiety, and increase children’s self-esteem” (p. 283). Most school days can be anywhere from six to eight-hour days. If students have 30 minutes of recess every day and 30 minutes of physical education on some days, this could lend to students being sedentary for nearly 5 to 7 hours. Within this amount of time, the focus, on-task levels, and ability to follow directions and give the appropriate attention is lost. There must be an incorporation of brain breaks to split up this amount of time to refocus attention. This integration of breaks in the classroom will allow the brain a moment to process the learning, having a positive effect on academic performance. Learning is greatly affected by children’s behavior in the classroom, specifically by their ability

to stay on task and follow directions. Movement in the classroom helps to refocus attention and gives the brain a break necessary to consolidate information (Savina et al., 2016, p. 285).

A quantitative research study was performed by Perera et al. (2015), investigating three objectives. The first objective was to assess current physical activity (PA) levels for Oregon public elementary schools through a physical activity survey. The second was to identify classroom teachers' preferences on how to increase physical activity levels for their students through a classroom teacher survey. The third and final objective was to provide and evaluate an exercise DVD that accommodates their preferences through a brain breaks survey. In 2012, within the physical activity survey, all 432 Oregon public elementary schools listed within the 2010-11 school directory, were phoned between April and May. There was an 88% response rate, with 379 schools responding. The researchers asked a series of five questions, seeking information about physical education (PE) class and recess. The classroom teacher survey consisted of mailing anonymous surveys in English to 210 teachers with a one-page questionnaire seeking classroom teachers' preferences on how to increase their students' PA levels. The response rate was about 60%, or 127 teachers participating. The last objective consisted of incorporating an exercise DVD called "Brain Breaks: Classroom Fitness for Children". According to Perera et al. (2015), the goal of this incorporation was to increase students' PA level during the school day by offering a variety of segments emphasizing different types of PA and address different physical and sensory needs of students. After showing the DVD for four weeks, teachers were asked to fill out a questionnaire regarding their perceptions of the DVD. In analyzing results, Perera et al. (2015) write:

Most teachers (84%) were "concerned" or "very concerned" about the students' PA levels. Nearly all teachers perceived that regular PA breaks during the school day is

“important” or “very important” (97%) and that regular PA breaks during the school day benefits students (98%), as it improves students’ concentration (90%), energy level (58%), and peer interaction (47%). (p. 57)

From this data collected, one can see a concern many teachers have for their students in having the time to participate in physical activity breaks throughout the day. There is a direct connection to the social health of students when they have a mental and physical break as a group. Not only do students benefit socially and physically from active brain breaks, but they also grow academically. After a certain point in instruction, however, the brain needs time to process the learning before the information becomes too much to process effectively. “Children’s brains require PA breaks to process information after intense instruction” (Perera et al., 2015, p. 61). This time to process instruction effectively, yields a greater grasp onto the concepts being taught.

This study does have its limitations. With the heavy focus on the specific brain break program analyzed, the study does not consider other brain breaks that exist outside of this program. A teacher can use a variety of activities such as a game, yoga, or a quick walk out of the classroom as a break for students.

Although Savina et al. (2016) and Perera et al. (2015) collect and present data in very different ways, they both present a very similar case in the positive effects of movement in the classroom. One topic highlighted specifically in both these studies is the evidence found supporting growth on academics through brain breaks due to the brain having the necessary time to process information after intense instruction. Movement through brain breaks allows the brain to consolidate the information before receiving further instruction.



In a different study, Stryp et al. (2023) present “School children spend an average of six hours a day at school, and 65% of this time is spent sedentary. Children who adopt sedentary behavior are more likely to experience cardiometabolic risk factors, lower self-esteem...[and] possible lower cognitive development” (p.399). In this mixed methods approach by Stryp et al. (2023), forty-eight six- to eight-year-old children divided between two classes from a school in the Western Cape Province, South Africa to participate in a study in which the aim was to investigate the impact of classroom-based physically active brain-breaks on the in-school activity levels of grade one learners. These students wore Actigraphs accelerometers for five consecutive school days. The devices were placed on the children’s dominant wrist at 8:00 in the morning and taken off at 1:00 in the afternoon. The objective of these measurements was to monitor children’s PA patterns, while also trying to establish time spent sedentary. Afterwards, these students engaged in a six-week active brain-break intervention by participating in a 10-minute classroom based active brain break twice a week. Stryp et al. (2023) present, “The results showed a significant increase in the vigorous PA patterns of the children during school time and consequently reduced sedentary behavior as well” (p. 406). During school time, recess and physical education classes provide small amounts of physical activity. In the classroom there needs to be short breaks, as well, considering the lengthy times they remain sedentary.

“Therefore, the active brain breaks can likely increase children’s moderate and vigorous PA levels on the days where no PE [physical education] is scheduled on the timetable.” (Stryp et al., 2023, p. 406) This study exists as just one research journal on the push for extra activity in education promoting healthy benefits. Stryp et al. (2023) also write “Research found that classroom based active brain breaks had positive effects on children’s on-task behavior and academic performance...[and] could potentially contribute to the holistic development of

children by enhancing their mental, physical, emotional, and social development” (p. 406).

Although this study analyzed well the effects of incorporating brain breaks, it does have its limitations. It focused its study on a younger age and only looked at the effects based on brain breaks twice a week. There exists a wide age range of students who benefit greatly from breaks more than simply twice a week.

Savina et al. (2016), Stryk et al. (2023), and Perera et al. (2015) discuss the importance of active breaks in the classroom. They each analyze data on physical movement and the direct benefits to the mental, emotional, social, academic, and physical health of students. A systematic review done by Kariippanon (2021), analyzes five quantitative studies and one qualitative study. The purpose was to examine evidence on flexible learning spaces looking broadly between both the public health and educational perspective to collate evidence informing the efforts addressing sedentary behavior in the classroom. As similar to the study done by Stryk et al. (2023), Kariippanon (2021) also includes concern on high rates of classroom sedentary time, “Greater time spent sedentary has also been associated with depression in adolescent girls and a reduced ability to control attention and on-task behavior among early adolescents” (p. 134). The study results of analyzing flexible learning spaces allowing movement indicated high cognitive and emotional engagement, increased interaction with peers, and improvements in academic results. Although this systematic review pulled the data together in a meaningful way, Kariippanon (2021) writes “A limitation of this review is that the included studies were all pilot in nature, with small sample sizes, conducted across a very small number of schools” (p. 143). The greater the sample sizes, yields more valuable depth of data.

Another study conducted by McMullen et al. (2014) focuses an investigation on exploring classroom teachers’ perceptions of incorporating physical activity breaks in the

classroom, as well as to determine specific features of activity breaks. Data was collected through semi structured interviews and reflective journals through twelve elementary and high school classroom teachers from one Indigenous school district. The twelve participants, six female and six male, included four elementary teachers and eight who taught at the high school level. The complete program was implemented over five years and included aspects of other school health change models. Teachers attended professional development workshops and had access to peer and external mentors, as well as received resources such as small equipment and extensive physical activity break ideas. The data collected reveals some distinct characteristics teachers considered when selecting and evaluating activity breaks. McMullen et al. (2014) present a slightly different view than that of Savina et al. (2016), Stryk et al. (2023), Perera et al. (2015), and Kariippanon (2021), in that the study also finds the challenges of brain breaks and the concerns teachers present regarding the effects of activity breaks. “When looking at reasons why teachers would use an activity again or not and weaknesses of activity breaks, most of the participants mentioned issues of student behavior and/or classroom management” (McMullen et al., 2014, p. 516). Results of this study found some themes in that some teachers expressed concern with the chaos, space constraints, and the challenge of getting back on task with the learning. There certainly are some behaviors that escalate when brain breaks are incorporated. However, McMullen et al. (2014) also state “Interestingly, some of the teachers used the activity breaks to increase teacher control in the classroom. These teachers used the breaks as a reward and student misbehavior on other classroom tasks threatened the students’ access to activity breaks” (p. 518). This study brings forth another concept based on some teacher reflection that argues with Stryk et al. (2023) when McMullen et al. (2014) write “Many of them reflected more positively on the activity breaks that allowed them to incorporate academic content...teachers

mentioned that their students were able to learn the content more effectively when they were incorporated into an activity break” (pp. 518-519).

Some teachers find the idea of including academic content into brain breaks effective to the academic content being learned. Some teachers find brain breaks to be disruptive altogether. Both of these views, however, disagree with other studies analyzed in this paper. As with any study though, there are limitations that must be noted. McMullen et al. (2014) state “What is unclear, and was not explored in the current study, is the notion of when movement actually becomes a problem –or turns into chaos from the teacher’s perspective” (p. 522). This study certainly brings forth the voice of some teachers through its interviews and reflective journals, however, this sample size for reflection is quite small and therefore, may not provide the most accurate reflection on teacher perception. In analyzing brain breaks and their effect, it must be noted conducting appropriate brain breaks for the space and managing the classroom effectively are factors in considering their effect. Brain breaks can be a tool. However, rules for breaks must be explicitly taught and practiced for successful implementation. Brain breaks incorporated inconsistently without proper instruction on how to engage with them and return to academic content, could result in undesired effects.

Overall, the above studies by Savina et al. (2016), Stryk et al. (2023), Perera et al. (2015), Kariippanon (2021), and McMullen et al. (2014) all analyze the effects of brain breaks in the classroom, and how they can affect academic content, as well as social, emotional, and mental health of adolescents. However, McMullen et al. (2014) reflect a bit more on the side of caution with utilizing brain breaks. It is still noted in the study though, there is not enough daily physical activity “even with well-established and internationally accepted guidelines in place, the majority of young people in the United States often do not engage in appropriate amounts of daily

physical activity” (McMullen et al., 2014, p. 512). As stated in the study earlier by Savina et al. (2016), “Physical activity is positively associated with youth emotional well-being...73 studies found that physical activity had a small but significant effect on children’s mental health. More specifically, physical exercise can reduce stress, depression, and anxiety, and increase children’s self-esteem” (p. 283). This research has revealed through a variety of methods that physical activity has a positive effect on the mental health of adolescents. However, in order for brain breaks to be successful, it must be implemented appropriately. This research positively exhibits the need for movement. In the case of inside the classroom, this could be exhibited in the form of brain breaks. However, the following studies will explore the importance of implementing movement and hands-on experiences in an outdoor setting as well. Outdoor education and opportunities that exist outside for students to learn and enhance new skills, develop greater social awareness, and grow mentally and emotionally are of great importance. These studies will explore the data collected to support this vital need.

### **Outdoor Education**

In the previous theme, brain breaks are considered a tool used in helping support both student’s academic achievement and social emotional health through the opportunity to move and remain physically active throughout the day. This second theme focuses on how outdoor educational opportunities and hands-on experiences in the natural world can support not only the mental, social, and emotional health of adolescents, but their academic achievement as well. The research below by Mutz et al. (2019), Sobel (2020), James and Williams (2017), White (2007), Miller et al. (2021), and Fiskum and Jacobsen (2012), present several such experiences of students surrounding themselves in opportunities to be curious, hands-on, and adventure outdoors. These studies show the positive effect it has.

In a qualitative study by Mutz et al. (2019), 108 German speaking middle class adolescents between the ages of 13-20, voluntarily joined a 10-day outdoor adventure program in the French Tarn-et Garonne department, a region famous for hiking, climbing, and canoeing opportunities. This particular study took place between May and July of 2016. Mutz et al. (2019) describes the core educational goal being “personal development and team building. During the 10-day program, participants stay at base camp on a non-public campsite where they sleep in tents and are responsible for the organization of the camp, including cooking” (p. 59). A pre-post- test was given to the participants before and after this experience with a questionnaire, both including identical measures for mental health. There were six aspects of mental health considered in the results of the questionnaires: worry, tension, demand, joy, hedonic balance, and life satisfaction. Results were also broken into two groups to analyze the connection of screen time to benefits of outdoor education: high media consumers and low-to-moderate media consumers. In both groups, there was an evident decrease in the feelings of worry, tension, and demand, with a positive increase in the aspects of joy, hedonic balance, and life satisfaction. Mutz et al. (2019) indicates “the program was not only associated with a reduction of stress, but also with a significant gain in satisfaction and happiness” (p. 61). When students have the opportunity to engage in educational activities in an outdoor setting, many start to feel lower levels of stress as they learn. This helps in the brain retention of academic learning and material. This is also noted by Savina et al. (2016) and Perera et al. (2015) above as they present data highlighting the evidence found supporting positive growth on academics if the brain has the necessary time to process information after instruction.

There were two limitations within this study in which Mutz et al. (2019) writes “Firstly, there is a lack of comparison group who did not participate in any outdoor adventure activities. Secondly, we were not able to collect follow up data some weeks or months after the program.”

In his qualitative study, Sobel (2020), describes the happiness that comes from outdoor education by focusing on ‘Forest Fridays’ and ‘Forest Schooling’. Eliza Minnucci, public school Kindergarten teacher in Quechee, Vermont, developed ‘Forest Fridays’ as a nature-based program. This program consists of four days a week in the regular classroom with Fridays being outside in a forest classroom just a 15-minute walk up into the woods. Testimonials have come from parents with great response. Sobel (2020) summarizes a parent’s response that this program “engenders responsibility, initiative, and confidence” (p.1067). Digging deeper into what Sobel was analyzing here, he presents another case. Jennifer Kramer, a sixth-grade teacher in Guilford, Vermont, and Sobel’s wife, implemented this type of ‘Forest Fridays’ with her twenty-two challenging students. A third of these students have Individual Education Plans. Within this outdoor program, Jennifer Kramer walks a mile through the village to a piece of conservation land, the Weeks Forest. Here, she lets her students run with their imagination and creativity as the students wade in streams, cook over a fire, construct forts, make bridges, sled, track animals, and create their own clans with currency. From this, parents have become involved with helping students actually build a bridge and teaching them how to whittle. When they return to school on Friday afternoons, they journal and write stories about their experiences. This particular class had a reputation for being a harder group with especially low math score percentages. Sobel (2020) follows their math test scores starting from their third-grade year stating “21% of the students proficient at the end of third grade, 27% proficient at the end of fourth grade, 26% proficient at the end of fifth grade, and 71% proficient at the end of sixth grade” (p. 1069). These

results raise the question of if this reflects the teaching done by Mrs. Kramer. Does this connect to her outdoor program? During their time on Fridays, students had “to problem-solve, work out disputes, and collaborate on technical innovations. They had to contribute their labor to the service of the whole...children are developing more grit, perseverance, confidence, a sense of place, happiness, and their test scores are improving” (Sobel, 2020, pp. 1068-1069).

There are some limitations with this study. A small and limited pool of observation can be very limiting in its data presented. Presenting information such as this, without gathering more data from other styles of teaching, could be misleading in the results. Another limitation is opportunities like this vary in geographical location and from school to school that would allow this. There should be a greater pool of applicants participating in such studies to determine consistency.

Both Sobel (2020) and Mutz et al. (2019) present a case for an increased degree of happiness among students from the experiences they participated in. Although different in the adventures experienced, each study details the positive growth in mental, emotional, social, and academic health that comes from participating in outdoor education. Regardless of the experience, growth was evident.

Within the world of education today, there has been placed much focus on the concept of testing, including standardized testing, as well as informal weekly testing in the classroom. This focus has led to an unhealthy effect on the mental health of both students and teachers. Some teachers have developed fears and anxieties, as they work to gain desirable scores from their students. They have had to abandon any time for outdoor learning, to focus heavily on the curriculum to meet the demands of high stakes testing. Studies have been initiated to determine the benefits of needing to keep implementing outdoor education. One such study in March of



2017 by James and Williams, consisted of 56 middle school students, 8 preservice teachers, and 3 classroom teachers. Qualitative data was collected involving participant observation and individual interviews after a two-day, one-night outdoor educational experience. According to James and Williams (2017) “Forty-four of the fifty-six seventh and eighth graders (79%) indicated that the outdoor education camp was worthwhile. Middle school student responses indicated that they enjoyed learning environmental science concepts in a hands-on, active, and experiential way” (pp. 63-64).

For many, actively applying hands-on experiences bridges the connection between learning and applying. James and Williams (2017) quote a middle schooler’s response “We didn’t just get data from some worksheet; we saw *how* the data was collected, and that makes it much more meaningful” (p. 64). These hands-on activities create a greater connection to the learning taking place, which in turn will make it easier to remember. No matter the learning environment (indoor or outdoor classrooms) when learning is active, experiential, and applied in real-world contexts, it is memorable and more easily committed to long-term memory (James & Williams, 2017). Not only will being immersed in effective outdoor education enhance the academic learning and content, but it will also increase student confidence as they learn it. This confidence built will therefore develop a greater sense of self and ultimately, a stronger emotional and mental well-being. “Building confidence and independence by solving problems on their own and with a team is often an unplanned benefit of experiential outdoor education. Indeed, experiential outdoor education is a necessary, but often neglected, aspect of school curriculum” (James & Williams, 2017, pp. 68-69).

The limitations noted in this study is indicated by James and Williams (2017), “While being systematic in the inductive analysis of the data, the researchers occasionally encountered

challenges related to their subjective interpretations because of preconceived ideas from knowing the students. This may have introduced some bias into the results” (p. 63).

This study by James and Williams (2017) supports the authors Sobel (2020) and Mutz et al. (2019) through its focus on how outdoor education benefits the mental health of adolescents. The authors (2017) also work to present the supporting evidence of how hands-on experiences can have a long-term effect on memory. This effect creates a greater level of engagement in learning, which in turn promotes greater levels of success in academics.

Among the many benefits of outdoor education and adventure-based learning, exists the enhancement of social skills and teamwork. A qualitative research project conducted by White back in the winter of 2007 in Essex, England, consisted of an outdoor education program that was developed for students (aged between 10-14) who displayed signs of emotional difficulties and engaging with school and family life. In the experimental group, twenty-two year eight students participated in the adventure-based learning experience. White (2007) describes that the program consisted of three developmental stages. The first stage consisted of four two-hour weekly sessions with a social constructivist approach taken to develop trust and build effective communications through trust games and challenges as a group. The second stage involved a five-day residential component within the Outdoor Education Centre including initiative activities such as canoeing, high ropes course, hiking, and wall climbing, followed by feedback sessions. Lastly, the final stage consisted of a three-and-a-half-day wilderness trip to the Brecon Beacons of Wales where the students completed a backpacking trip over rugged terrain. Participants were responsible for meal preparation, pitching camp, and meeting any of the group’s needs. This also ended in a debriefing discussion. Results of the study found participants

reported positive results in relationship building, group cohesion, and emotional regulation.

White (2007) describes the results:

100% of the participants indicated that the experience was ‘highly successful’. 86% of the students reported that their self-confidence had improved, 78% felt that they had increased their ability to persevere through frustration, and 64% believed that they had become more aware of the needs of others. 89% thought that these changes would last for their lifetime. 88% reported that they have an increased ability to regulate their emotions, 75% indicate that they have experienced positive gains in their family since participating in the program. Finally, 100% of the participants report that they have developed a deeper level of trust in the other group members” (p. 81).

As evidenced in this study, an integrated outdoor educational program can fill a critical role in improving children’s academic performance, family relations, and social well-being” (White, 2007, pg. 84). Although programs may operate differently in what they offer, the ability to connect outside as a group in an active, hands-on learning experience will yield great growth to self-confidence and social awareness. Building trust and relationships as a group is a key component to creating healthy dynamics in a learning environment, which ultimately promotes greater levels of learning for the group.

White (2007) highlights the limitations of the study by stating that the project occurred at only one secondary school in Essex, England and was facilitated by one Outdoor Education Centre. A broader project consisting of a larger number of schools, outdoor centres, and program participants would be necessary for the findings to create clearer results. In addition, this project was very specific to the program. It may be erroneous to claim all adventurous activities would support the same positive results.

Research continues to be done in analyzing the concept of nature-based learning. Some studies are working to analyze how this type of learning affects different domains. In 2021, a study was published by Miller et al. to analyze nature-based learning. Its focus was to examine domains such as physical activity, mental health and wellbeing, education, engagement, and social outcomes. This particular quantitative research was conducted in Australia and the age ranged from four to twelve years, with a large participant size of 3,283 students. According to Miller et al. (2021), the outcome of the study states “It is commonly accepted that nature-based learning supports children’s overall wellbeing and development, encourages learning, and improves social skills. These are relevant and desirable outcomes in a school setting” (p. 1118). The outcomes of each domain were measured through different methods such as questionnaires, observations, and standardized tests. For example, within the engagement domain, observations were used to watch the student’s ability to pay attention and stay on task in class. Miller et al. (2021) present the “key findings suggest nature-based learning has varying level of positive impacts across all domains” (p. 1128). Within any environment, particularly at a school however, the goal should be that kids are developing, learning, and engaging in social settings. Their wellbeing and development must be nurtured. For many students, excitement in what they are doing or learning yields to greater engagement, which in turn, generates greater educational achievement.

As with any research, there are limitations. Miller et al. (2021), presents “although this review focused on children up to twelve years of age, it is unclear what, if any, impact nature-based learning may have on children aged thirteen and older” (p. 1134).

Another study conducted through a mixed methods approach by Fiskuum and Jacobsen (2012), explores the differences in the children’s outcomes from outdoor education. The goal

was to answer the question of whether the variations in learning conditions have positive effects for most children or only for a little group of children at risk, or for none. Data was collected on a small group of participants in Norway through observations. Seven boys and five girls were recruited from a primary school in grade one to grade four, and once every second week from grade five. Observations were conducted in indoor education and outdoor education, at an outdoor education area. Four trained observers observed three pupils each in different variables of observations such as physical activity, motor agitation, verbal agitation, observation of emotion, and observation of communication. The results of the observations varied as the effect from outdoor education varies from child to child, as well as between temperamental-dimensions, gender, and belonging to special education group or not. Fiskum and Jacobsen (2012) write “Research has shown outdoor education to give positive impact on children’s motor and verbal agitation, increased variability of emotions, more positive communications and more physical activity” (p. 20). For many, outdoor education will have a positive effect on mental health, and therefore, their learning. However, the degree to which this effect happens is different for each student. In this study, for most of the pupils, outdoor education affects the outcomes of physical activity, motor agitation, verbal agitation, neutral emotion, and positive communication in a positive way. However, although some respond well both indoors and outdoors, some students will actually see a significant decrease in behavior outdoors. Behavior during indoor education is problematic and frequently corrected, however, engaging in outdoor education opportunities, most of the behavior that has to be corrected is absent (Fiskum and Jacobsen, 2012, p. 27). One example Fiskum and Jacobsen (2012) gives is “Since boys usually are more physically active than girls, outdoor education may give them better possibilities to increase their

levels of physical activity, or the possibility to be physically active may reduce their effortful control to behave” (p. 27).

The advantage of a study design such as this is, is the possibility to look into each individual’s sensitivity to the variables. However Fiskum and Jacobsen (2012) write “a limitation of this study is the low number of subjects” (p. 28).

The above research conducted by Mutz et al. (2019), Sobel (2020), James and Williams (2017), White (2007), Miller et al. (2021), and Fiskum and Jacobsen (2012) concerning outdoor education, all suggest the clear evidence supporting the positive outcomes observed not only on the social, emotional, and mental health of adolescents, but also on the greater academic achievement, cognitive development, and long term memory effects of their learning. There is clear evidence supporting the role hands-on experiences, particularly in a natural setting, have. The social connections that can be developed as well remain a vital benefit of engaging in outdoor education. The following research explores the effects technology can have on student mental health, academics, and the amount of time spent outdoors.

### **Technology**

There has been an increase in technology, particularly in the last several years. A look into technology as it relates to mental health, and the connection it has in reduced outside time is researched in the following studies by Camerini et al. (2022), Nielson and Arvidsen (2021), Warber et. al (2015), and Sampasa-Kanyinga et al. (2022).

In a study conducted by Camerini et al. (2022), there is a focus on researching two behavioral factors potentially associated with childrens’ and adolescents’ mental health during the COVID-19 pandemic: screen time (ST) and green time (GT). Screen time encompasses very different activities such as consuming news or entertainment programs, online gaming, social

media use, instant communication with peers and family members, and online searches for information (Camerini et al., 2022, p. 2). Green time, however, comprises time spent in nature, such as parks, woods, gardens, and playgrounds, which also entails and facilitates outdoor physical activity (Camerini et al., 2022, p. 2). Data was collected between the fall of 2020 and spring of 2021 with a size of eight hundred forty-four participants, including children and adolescents aged five to nineteen. The mixed methods approach was based in Canton Ticino, Italian-Speaking Switzerland. The aim of the present study was to investigate whether ST and GT during the COVID-19 pandemic influenced mental health among children and adolescents over time (Camerini et al., 2022). It combines repeated survey and serology measures and assessments collected in a representative sample of the general population. Baseline and monthly follow-ups included relevant mental health and ST and GT measures were considered. Screen time (ST) was assessed on month one, month three, and month five with the following four open-ended questions: (a) “How many hours did you (your child) spend on electric devices (e.g., smartphone, computer, PlayStation, Xbox, Nintendo, TV) on a typical weekday?” (b) “How many of these hours did you (your child) spend for school-related activities?”, (c) “How many hours did you (your child) spend on electric devices on a typical weekend day?”, (d) “How many of these hours did you (your child) spend for school-related activities”? Green time (GT) was assessed on month one, month three, and month five as well, with two open-ended questions: 1.) “How many hours did you (your child) spend outdoors in nature (e.g., garden, park, playground, woods) on a typical weekday, excluding school-related activities?”, 2.) “How many hours did you (your child) spend outdoors in nature on a typical weekend day?” (Camerini et al., 2022, p. 4). Mental health during the last two weeks was assessed on month six across a set of seven subdomains measuring symptoms for six to seventeen year old individuals: somatic symptoms

(“Been bothered by stomach aches, headaches, or other aches and pains”), sleep problems, inattention, depression, anger, irritability, and anxiety. Results were run through many different variables, however, ultimately Camerini et al. (2022) concludes “higher levels of GT were related to lower levels of mental health problems across the study participants, whereas higher levels of ST were related to higher levels of mental health problems” (Camerini et al., 2022, p. 6). The opportunity to experience the world outside is vital, not only in regard to strong mental health, but also to greater cognitive development. There are certainly different aspects of technology that can be positive. However, green time encompasses an extensive variety of activities that support higher levels of mental health, cognitive abilities, and social interactions. For example, green time encompasses physical activity, outdoor play and creativity, while also including calming breaks like walks, or picnics in the park (Camerini et al., 2022, p. 8). Regardless of the activity, each of these may allow for positive in-person social interactions, building the social and emotional health of adolescents. Although screen time also allows for online peer interactions in which stress can be reduced, it can also be a platform for much greater anxiety and depression. Camerini et al. (2022) add “In addition, FoMO caused by greater exposure to online, mainly social media contents, might have contributed to worsen mental health” (p. 7).

Camerini et al. (2022) note some limitations in this study. A rigorous probabilistic sampling method was used to be able to generalize the findings to the underlying population, but the results should be applied cautiously and mainly to similar populations since only 23% of all invited agreed to participate in the study. A selection bias seems unlikely because the salient characteristics of participants in the analytical sample did not significantly differ from those of



excluded participants. Another potential limitation is the use of parent reports for children aged five to thirteen.

When thinking about technology, it is important students are receiving more time spent in activities supporting their social interactions, mental health, and cognitive development.

Technology is a tool that can also be destructive when not utilized appropriately. A mixed methods designed study by Nielson and Arvidsen (2021) was conducted to explore how smartphone use affects children's outdoor experiences. Interviews with a small sample of children (N=34) were used to help develop a questionnaire for a larger sample (N=1148). The aim of the study is to explore three research questions: (a) How dependent are children on their smartphones? (b) What smartphone functions do children use in their outdoor lives? (c) How does smartphone use affect children's outdoor experiences? (Nielson & Arvidsen, 2021).

Interviews were analyzed using qualitative content analysis. Participants within this study were children between the ages of eleven and fifteen, grades five through eight, recruited through Danish schools. Results suggested children are highly dependent on having their smartphones available as an integrate part of their lives (Nielson & Arvidsen, 2021). The authors also write "Being outdoors has shown positive health impacts, increased well-being, while also stimulating motor skills development and movement in children. However...children do not interact with nature in the same way and with the same frequency as previous generations" (Nielson & Arvidsen, 2021, p. 1). As technology continually evolves, students are spending less time outside and more time inside with smartphones or other forms of technology (TV, computers, video games, etc.). This increase in smartphone use creates habits involving more sedentary practices, and less time outdoors. Nielson and Arvidsen (2021) confirm that "Especially the last few

decades, increase in smartphone use is pointed out as one of the main reasons children spend less time outdoors and show an increasingly inactive and sedentary behaviors” (p. 1).

In the previous study we analyzed by Kariippanon (2021) about brain breaks, we read “Greater time spent sedentary has also been associated with depression in adolescent girls and a reduced ability to control attention and on-task behavior among early adolescents” (p. 134). Miller et al. (2021) also stated earlier that “It is commonly accepted that nature-based learning supports children’s overall wellbeing and development, encourages learning, and improves social skills. These are relevant and desirable outcomes in a school setting” (p. 1118). These studies all work together to urge the importance of children and adolescents to spend time outdoors and increase their physical activity. Technology, particularly smartphones, has not aided in the help to encourage these behaviors. Nielson and Arvidsen (2021), however, do find some conclusions in their study that smartphones may create favorable conditions for rich and valuable outdoor lives by expanding (a) children’s sense of security, (b) children’s outdoor sociality, and (c) children’s opportunity to mold their outdoor experiences (Nielson & Arvidsen, 2021, p. 1). As with many tools, they must be used appropriately and within reason. However, they can certainly be used as an asset. Nielson and Arvidsen (2021) write “the digital world...is not ‘all bad’ but should instead be regarded as a condition in modern children’s lives and an asset to embrace in future strategies of actively engaging children in the outdoors” (p. 10). When used as a positive method of support and strategy in engaging children outdoors, the digital world can be rewarding.

Nielson and Arvidsen (2021) include the strength of this particular study is the mixed methods design, as combining qualitative and quantitative methods can ensure richer and more credible data to support the understanding of the interaction between the children, their

smartphones, and the outdoors. However, every study can have its limits. The response rate of this particular design was merely 43%. This lower response rate may not have the most accurate representation of the whole group. Neilson and Arvidsen (2021) also state “smartphone use outdoors and children’s experience hereof might vary across seasons, which may compromise the validity of the findings” (p. 10).

The above research connects the idea that technology must not be overused to take away from spending time outdoors. The effects nature has on adolescents has been proven positive, as discussed in the research above. The result of not experiencing this needed time outdoors can result in the risk of “nature-deficit disorder”. Warber et al. (2015) conduct a mixed methods approach study of young adults attending a four-week wilderness camp to investigate whether nature-based camp experiences would increase connection to nature and promote multiple dimensions of well-being. Participants completed pre-camp ( $n=46$ ) and post-camp ( $n=36$ ) online questionnaires including nature-related and holistic well-being measures. Interviews ( $n=16$ ) explored camp experiences and social relations. The camp is held in the rural mountains of West Virginia, USA, in a cell phone-free area. Warber et al. (2015) states the “Findings demonstrate the change in relationship to nature that an immersion experience in wilderness can provide while also delineating elements of well-being that can be affected during time spent in nature” (p. 9). Not only do these experiences and time in nature affect the mental health in a positive way, but the social time together builds connections that are different than those engaged through an online platform. Warber et. al (2015) quotes a reflection on “the priority of human interaction over technological interaction: ‘to look to people first before...Google’” (p. 9). Warber et. al (2015) follows with the idea that “being in the natural environment, away from

the usual urban setting with its distractions (e.g., continuous internet access), provided a space for human-to-human interaction, allowing friendship to grow” (p. 9)

Some limitations are noted within this study that the inferences that can be drawn are limited by the small sample size and by the lack of a control group. The 78% response rate for the post questionnaire was also not as robust as the intent was. Spending time in nature is essential for the health of not only children, but also for adults. Screen time has become one barrier to more children experiencing opportunities, such as the one mentioned in this study. Warber et. al (2015) write:

Elements of our urbanized lifestyle, including fewer natural spaces, a car-focused culture, more screen time, changes in the perception of risk (e.g., “stranger danger”), less leisure time, and increased time pressures from work or school, combine to decrease or even eliminate contact with nature for both adults and children. He proposes that direct exposure to nature is essential for the physical and emotional health of both children and adults (p. 1).

Each of the above studies, though unique in their approach, all work together to present findings not only on the benefit of outdoor opportunities, but also on the idea that screen time can be a positive tool, or a barrier to improving the mental health of adolescents.

In a different study by Sampasa-Kanyinga et al. (2022), a mixed methods approach was taken to determine the prevalence of problem technology use and examine its association with academic performance and school connectedness. The term technology use refers to screen-based activities relating to computers, laptops, tablets, smartphones, or gaming consoles (Sampasa-Kanyinga et al., 2022). This particular study was conducted through a sample size of 4,837 students grades nine to twelve across Ontario, Canada. Data was collected from November

2018 to June 2019, across 992 classes, 263 schools, and 47 school boards. A total of 14,142 middle and high school students completed the survey with a student completion rate of 59%. Technology use was assessed using the following questions “About how many hours a day in your free time do you usually spend on electronic devices texting, messaging, emailing, chatting, watching videos, playing games, using social media, or surfing the internet?” (Sampasa-Kanyinga et al., 2022). Six questions were asked to help measure problem technology. A few examples include: (a) “How often do you neglect homework because you are spending more time on electronic devices?”, (b) “How often do you lose sleep because you use electronic devices late at night?”, and (c) “How often do you choose to spend more time on electronic devices rather than go out with your friends?” (Sampasa-Kanyinga et al., 2022). Academic performance was measured by the following question: “On average what marks do you usually get in school?” (Sampasa-Kanyinga et al., 2022). Lastly, school connectedness was measured using the following three statements: “I feel close to people at this school”, “I feel like I am part of this school”, and “I feel safe in my school” (Sampasa-Kanyinga et al., 2022). After cross sectionally analyzing the self-reported data, Sampasa-Kanyinga et al. (2022) conclude that “Excessive use and problem technology use are highly prevalent among secondary school students, and they are associated with lower academic performance and lower levels of school connectedness” (p. 1). As stated in previous research, technology can have its benefits, such as enhanced ability to work, reduced depression through leisure time, and connecting socially digitally, however, exceeding the guidelines can have detrimental effects. Sampasa-Kanyinga et al. (2022) present “Technology use can be associated with numerous benefits for child development...however, a vast majority of adolescents exceed the recreational guidelines. Research indicates heavy technology use is associated with lower academic performance among

adolescents” (pp. 1-2). The term problem technology, used to describe the behavioral problem by devoting so much time on technology, is an emerging issue. This excessive technology use has also been associated with several adverse health outcomes, such as mental health problems, poor sleep, injuries, aggressive behaviors, and addiction-related issues (Sampasa-Kanyinga et al., 2022). There are recommendations for technology use. Sampasa-Kanyinga et al. (2022) present “These findings support the current public health recommendation that children and youth should spend no more than 2 h[ours] per day in recreational screen time. Results highlight the need to find ways to reduce time spent using technology” (p. 12). Think of the mental health benefits for children and adolescents when working to combine the results of this study of reducing time spent on technology with the results of the studies by Miller et al. (2021) stating the positive effects of nature-based learning. There would be a great increase in social, emotional, and mental health, while also allowing for more active time outdoors.

Sampasa-Kanyinga et al. (2022) presents a few limitations of this study to consider. First, this was a cross-sectional study, therefore, cannot establish a causal relationship between problem technology use, academic performance, and school connectedness. Second, data was also based on self-reports, which can create a potential for recall and desirability biases. Also, the study did not examine the association between time spent on specific technology use (e.g., smartphones, tablets, laptops, etc.) with academic performance.

The above research by Camerini et al. (2022), Nielson and Arvidsen (2021), Warber et. al (2015), and Sampasa-Kanyinga et al. (2022) regarding technology and how it connects to the mental health of students, presents the idea that technology can have its benefits, however, can also have negative effects when used excessively. It can be harmful on not only mental health, sleep, and ability to control attention, but also on lower academic achievement. The studies

suggest reducing the time spent on technology, and continuing to connect out in nature as a way to support the health of students.

Overall, the three themes work together through the research to provide educational leaders with the necessary information in knowing what factors can be harmful on the mental health of adolescents, and also suggests ways to help improve and support the mental, social, and emotional health of adolescents, through movement and outdoor educational opportunities.

### **Review of the Proposed Problem**

In light of what is known about pedagogy in the contemporary educational setting, how do outdoor educational opportunities and movement in the classroom affect the mental, social, and emotional health of adolescents? The above research highlighted three themes to help support students mental, social, and emotional health of adolescents. The first theme supports the concept of movement through brain breaks and physical activity, as a way to increase on-task behavior, academic learning, and overall mental health. The second theme involves outdoor education and nature-based learning as a support in providing the necessary time with peers and gaining hands-on experience in a setting that promotes creativity and increased levels of mental, social, and emotional health. The third theme involves analyzing how technology can have a negative impact on mental, social, and emotional health, while decreasing time spent outdoors. Although it has positive benefits, it must be utilized appropriately.

### **Review of the Importance of the Topic**

Mental health and learning opportunities are continued topics of conversation in the contemporary educational setting. There is a great need to support adolescents' mental health, learning, and experiences both in and out of the classroom. Adolescents risk a lack of social skills, poor emotional regulation, and an unstable mental health if the proper supports and

strategies are not implemented. Supports such as outdoor learning and physical activity opportunities. There is evidence for associations between nature exposure and improved cognitive function, brain activity, blood pressure, mental health, physical activity, and sleep (Jimenez et al., 2021). “Spending time in nature is linked to both cognitive benefits and improvements in mood, mental health, and emotional well-being” (Weir, 2020). As educators continually work to support adolescents and to help positively impact student development and learning, there must be an incorporation of educational opportunities, movement breaks, and an appropriate use of technology.

### **Summary of Findings**

In the research studies completed by Savina et al. (2016), Stryk et al. (2023), Perera et al. (2015), Kariippanon (2021), and McMullen et al. (2014), evidence is presented supporting brain breaks and movement as a way to improve the mental, social, and emotional health of adolescents. More specifically, physical movement can reduce stress, depression, and anxiety, while increasing confidence, focus, and on-task behavior. One study presents a caution in using brain breaks, as it can be disruptive to learning. Utilizing this tool appropriately, however, will yield a greater support for the mental, social, and emotional health of adolescents. Several of the authors present a unique collection of data stating breaks actually support the brain, as it has the needed time process the academic learning. The authors also together support the idea of needing to move as to reduce the amount of time spent sedentary, as time spent sedentary can be harmful on the cognitive development and mental health of adolescents.

The studies conducted by Mutz et al. (2019), Sobel (2020), James and Williams (2017), White (2007), Miller et al. (2021), and Fiskum and Jacobsen (2012) present common findings that outdoor educational opportunities and nature-based learning improves educational outcomes,



and supports the mental health and wellbeing of students. The authors had a common outlook as they present outdoor opportunities support not only mental health in adolescents, but also supports the development of connections among peers as they experience the opportunity of outdoor learning and educational programs together. The limitations were also similar in suggesting larger pools of participants is helpful in supporting the research. One positive discovery from James and Williams (2017) reports hands-on activities within nature-based learning creates a greater connection to the learning taking place, which in turn, will make it easier to remember long term. This yields greater academic achievement.

The studies conducted by Camerini et al. (2022), Nielson and Arvidsen (2021), Warber et. al (2015), and Sampasa-Kanyinga et al. (2022) consider the effects of technology on the mental health of adolescents and the harmful effects it can have as it reduces time outside and can increase the time spent sedentary. The authors agree with the positive use technology can have, while also stating it must not exceed the recreational guidelines. Though technology can be a multipurpose tool, such as connecting with others, it can also be detrimental to the mental, social, and emotional health of children and adolescents. Authors note screen time within limits and reason can be helpful for depression, but must not reduce the amount of time spent outdoors. Overall, the authors caution the use of technology as educators work to support the mental, social, and emotional health of adolescents.

Each of these themes work together to answer the question of how outdoor educational opportunities and movement in the classroom affect the mental, social, and emotional health of adolescents. The themes explain sedentary behavior and spending too much time inside and on technology can create negative impacts on mental health. Movement, outdoor experiences, and limits on technology, work together to decrease those negative impacts and increase the overall

positive effects. Going beyond the theme of mental health in adolescents, we also see the growth that occurs on the academic achievement of students.

## **Conclusion**

Although every one of these studies has focused on a unique aspect of education, they each bring together a common theme of supporting the mental, social, and emotional health of adolescents. Whether this support comes through engaging students in a daily physically active brain break or a forest classroom every Friday, there continues to be a great need to lead students equitably and inclusively as to positively impact student development. All three themes work together to provide tools that support strong mental health, academic achievement, and opportunities to grow as students. Educators have a great opportunity to invest into the overall growth of adolescents in our communities, not only academically, but also socially. By providing hands-on experiences in and out of the classroom that allows for development, experience, and creativity, we will be doing our job as educational leaders. The following chapter will discuss insights gained from this research, how it applies to the educational setting, and possible future studies that could further support this study on supporting the mental, social, and emotional health of adolescents for ultimate success in the classroom.

### **Chapter Three: Discussion, Application, and Future Studies**

In this chapter, insights gained from research regarding supporting students mentally, socially, and emotionally through providing movement and outdoor educational opportunities, as well as remaining cautious with the overuse of technology, will be presented. Insights showing how movement and nature-based learning incorporated in and out of the classroom is vital to not only the mental, social, and emotional health of adolescents, but also to their academic achievement. This chapter will also discuss how these specific experiences and tools can be applied, as to support ultimate student success. Future studies to further support the themes discussed within this literature review will also be presented.

#### **Insights Gained from the Research**

Within the research analyzed, there were certainly connections between implementing brain breaks, nature-based learning, and the impact technology can have in either supporting or harming the mental, social, and emotional health of adolescents. One of the insights gained from this research is the incorporation of brain breaks as a tool being used to offer the necessary time for the brain to process the academic learning. The brain can easily become overwhelmed or overstimulated during lessons lasting an extended period of time. Movement in the classroom helps to refocus attention and gives the brain the necessary break to consolidate information” (Savina et al., 2016, p. 285). These brain breaks allow for an increase in movement which decreases the sedentary behavior. The research supported regular physical activity has a significant positive impact on mental health. The findings show the idea that it is vital educators provide adolescents with the opportunity to move, process, and create the space that allows for deeper social connections through the experience of engaging in breaks as a group.

Another insight gained from the research is the benefits that exist regarding experiencing outdoor opportunities and participating in nature-based learning. After participating in these types of experiences, students have reported feeling an increase in their joy, confidence levels, and social connections which in turn causes a decrease in anxiety, depression, and stress. Students become better connected as they are placed in positions to build their cohesion, trust in one another, and dependency on their classmates. Research also presents the data collected to support how these opportunities create hands-on experiences. In having access to hands-on activities through partaking in nature-based learning opportunities, exponential growth in academic achievement occurs. This concept builds the long-term memory of the content students are engaging in. This positive data collected, supports the argument for creating the necessary space and time for students to engage in outdoor opportunities.

The final insight gained from this research, is the tool technology can be, as well as the harm it can cause. Technology when used appropriately and effectively, can be an asset to learning, as well as decreasing levels of depression. However, it can also be detrimental to the mental, social, and emotional health of adolescents. The data also makes the connection between screen time and green time, or time spent in nature. Time spent in the digital world can decrease the time spent outdoors, which in-turn, may yield an increase in time remaining sedentary. There are guidelines regarding the usage in how much time should be spent on technology. Limits and boundaries must be set, as to reduce the harmful effects technology can cause. Positive effects were noted when limitations were incorporated.

The research analyzed discusses the opportunities to support the mental, social, and emotional health of adolescents. As educators learn who their individual students are, they soon discover the vast differences each one has in their ability to learn, focus, and respond to their

emotions. Systems such as brain breaks, outdoor education, and routines modeling appropriate use of technology must be put into place to support each student where they are mentally, socially, and emotionally.

### **Application of Research**

Much research has been analyzed and presented regarding brain breaks, outdoor education, and the caution of overusing technology. Data provided insight that school buildings and classroom teachers should provide the opportunity for students to have these experiences as to promote greater success in mental health and academic achievement.

When implementing brain breaks, however, it must be done appropriately and intentionally. Hesitations with this type of support in the classroom, revolves around the chaos and interruption that can occur when used. Therefore, there must be planned times throughout the day that they should be implemented as to avoid the interruptions. This may be during transitions between subjects in the elementary classroom. It may be ending a class early in middle and high school for a quick five-minute break. The type of brain breaks utilized will depend on several factors such as teacher comfortability, student behaviors, and time available. The teacher may utilize a game such as silent ball, yoga, or an exercise if movement is needed. Teachers being prepared, yielding a variety of resources, and explicitly stating the rules and expectations regarding brain breaks, and their use in class, will significantly decrease levels of interruptions and chaos. Teachers must take the necessary time to model the routines with the class, regardless of the age of the students, before implementing them.

When considering how to effectively implement outdoor education, creating opportunities for the students to be hands-on in a natural setting is a key component. Schools may consider creating space outdoors that allows for the opportunity to take students out during

the week. This may look very different depending on the community space, the region, school setting, and educator's experience. In some school communities, planned outdoor adventures to camps or parks, in which students participate in an overnight program, may be one way of implementation. For others, it may be finding space and time outside once a week every week in which students have the opportunity to explore, build, create, and utilize materials in the natural world. It may also be a simple implementation in which students conduct a lesson outside during the day. Ultimately, in order to lead in an equitable and inclusive way to impact student development and learning, administrators and teachers must work together as a team to support the vital component of movement and outdoor education and adventure into the learning of their students.

As schools work through the new adaptations and programs with technology, it must be considered that during school time, technology must be explicitly used as tools to support learning and not towards distraction or gateways into further issues. It must not be overused. Administrators and teachers, again, must work together to clearly indicate proper, healthy integration of technology into not only the classroom, but also everyday life. The role of educating students lies beyond just academics. Educational leaders have the unique opportunity to teach and model life skills students will use outside of the classroom. This opens the opportunity for educators to instill a passion for learning, both inside and outside, that may have an impact on their technology use at home as well.

The key to seeing the intended, positive results these research studies discussed is to know the students, the school, and the community. It's also important to create a passion for learning, developing life skills, and creating healthy habits with the students who can then practice, support, and build the community up.

## **Future Studies**

One future study to be conducted when considering the implementation of brain breaks, is following the student's behavior year to year with teachers who implement the brain breaks and those who do not, to compare the effects of how they may or may not support the students in the classroom. The study could also take the approach of studying students with similar behaviors, situations, and challenges from across different classes and compare the data of how brain breaks support the behavior in the classroom who uses them and how it may not in classrooms who do not utilize them. This may allow teachers to understand the impact incorporation of these breaks may have.

Another future study could be the concept of analyzing the varying degrees of effects outdoor education has on the learning of students. A yearlong study would be conducted with data being collected from observations and surveys from classes who participate in elaborate outdoor adventure program trips throughout the year and classes who engage in a simpler way by immersing themselves in nature just outside the school building one day a week the whole year. A third group would also be observed and surveyed from students who do not participate in any kind of outdoor education opportunities. The focus of the study would be to determine if more elaborate, focused outdoor education time would make a difference in seeing the positive effects it has versus the effects of not participating at all. This may help teachers as they incorporate outdoor education opportunities within their school. Not every school will have the same access to resources, locations, and opportunities as others, but potentially still seeing the positive effects even one day a week may have, will support the necessary need to be immersed in outdoor education.

Finally, a future study should be conducted on collecting data analyzing the effects overuse of technology can have on stamina, creativity, and focus, ultimately leading to how it can create behavior in the classroom. As students are engaged in higher levels of use, particularly with smartphones, the social skills, creative thinking, stamina levels of focus, and mental and emotional health may see a negative impact. A study collecting data overtime revolving around the stamina and focus levels of students may involve analyzing the frequencies in which technology levels are used by different students. Medical diagnoses, such as ADHD, and life circumstances would have to be acknowledged within the research. This will provide greater insight into the struggles students may have on their ability to focus, use creative thinking, social awareness skills, and their mental and emotional health.

These future studies may ultimately help in supporting schools and teachers with the necessary knowledge of how to support students in their mental, social, and emotional health. Providing the necessary movement activities, increasing hands-on experiences through providing opportunities to engage in nature-based learning, and by monitoring the levels of technology usage, educators will be doing their best to lead equitably and inclusively to promote greater student development and success.

## **Conclusion**

We can see through the research analyzed, schools and teachers have access to promoting greater student learning and development through the use of incorporating brain breaks, such as movement activities, and outdoor education through nature-based learning as to promote greater mental, social, and emotional health. Although curriculum and instruction are essential, the push for it should not create anxiety, stress, and a decline in mental health. These opportunities are healing for the mental, social, and emotional health and are vital to incorporate.



Three themes emerge from what has been analyzed: brain breaks, outdoor education, and the effects of technology. Each theme, though specific and unique on the focus it presents, promotes a common effort to better equip educators with the tools and knowledge that can be utilized to support adolescents not only in their mental, social, and emotional health, but also in their academics as well.

As educators work to lead in an equitable way to promote greater student achievement, it takes everyone collaborating together, administration, support staff, and teachers, each providing quality opportunity to engage in learning. Each student who walks through the front door of their school should walk in knowing there is a team waiting to support their needs, traumas, situations, mental health, and of course, their academic success.

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## Appendix

### Article Tracking Matrix

Articles	Methods	Brain Breaks	Outdoor Education	Technology
Camerini et al., 2022	Mixed Methods		X	X
Fiskum & Jacobsen 2021	Mixed Methods		X	
James & Williams 2017	Qualitative		X	
Kariippanon 2021	Mixed Methods	X		X
McMullen et al., 2014	Mixed Methods	X		
Miller et al., 2021	Mixed Methods		X	X
Mutz et al., 2019	Qualitative		X	
Neilson & Arvidsen 2021	Mixed Methods			X
Perera et al., 2015	Quantitative	X	X	
Sampasa-Kanyinga et al., 2022	Mixed Methods			X
Savina et al., 2016	Mixed Methods	X	X	
Sobel 2020	Qualitative		X	
Stryp et al., 2023	Mixed Methods	X		
Warber et al., 2015	Mixed Methods			X
White 2007	Qualitative		X	