5-2022

The Effects of Outdoor Education and Mindfulness Practices on Attention Issues of Third Graders

Elizabeth Carlson

The Effects of Outdoor Education and Mindfulness Practices on Attention Issues of Third Graders

Submitted on: March 24, 2022

in fulfillment of the final requirements for the MAED degree

Elizabeth Carlson

Saint Catherine University

Saint Paul, Minnesota

Acknowledgments

I would like to thank my friends and family for supporting me on the journey of completing this project. It would have been a lot tougher without them along for the ride. I would also like to thank my specialist colleagues for helping me iron out difficulties with the implementation of my research in the classroom. They showed me support and kindness far beyond what they needed. Thank you all!

Abstract

This action research project studied the effects of outdoor education and mindfulness practices on students with ADHD and generalized attention issues. The researcher conducted the study for six weeks from September to November 2021. There were thirty-eight students participating in the study from a private school in Minnesota. The intervention consisted of weekly outdoor lessons and mindfulness practices. Data sources included a pre-survey, behavioral data collection, field notes and observations, a final exam, and a post-survey. This study found that outdoor education and mindfulness practices greatly improved behavioral outcomes in students. There were no significant changes in the academic outcomes. In future studies, educators could create a school-wide mindfulness and outdoor learning intervention so students get more exposure. The academic outcomes could be researched further by using a pretest before the interventions are implemented to compare the data afterwards.

Keywords: ADHD, attention issues, outdoor education, mindfulness

Generally speaking, students' attention spans have seemingly become shorter and shorter as the years have progressed. Children move at a near-constant pace and rarely like to take a breath and slow down. Whether it be the numerous after-school activities or the technological devices always at their fingertips, kids are becoming accustomed to a way of life that is much different than previous generations. As more students come to school with attention issues and symptoms similar to Attention Deficit Hyperactivity Disorder (ADHD), it proves more challenging to keep the students' attention during a lesson, which can lead to more behavioral and academic difficulties in the classroom. Therefore, teachers are left with the task of coming up with lessons that are more engaging and implementing interventions that can aid their students in being successful in the classroom.

ADHD diagnoses have steadily gone up throughout the past four decades, and while the numbers have gone up, experts say that they believe there may even be a greater amount of undiagnosed cases in our student population. At the research school at which research was conducted, about 15% of the student population has been diagnosed with ADHD, and potentially many more undiagnosed. Being that this is a school with very minimal behavioral and special education services, it is imperative that the teachers at the school have interventions at their disposal that can really improve students' success both academically and behaviorally.

When researching ADHD and undiagnosed attention issues in a classroom setting, most of the interventions that were discussed were related to students' ability to self-regulate. One of the interventions implemented was mindfulness. The implementation of this intervention required both the introduction of the concept and the addition of the practice into daily classroom routines in order to allow students to regulate their emotions and reactions in the classroom. The other intervention that was used in the research was outdoor learning. In Minnesota, we are fairly

limited to our access in this area because of weather conditions, but the research was done at the beginning of the school year, making it possible.

When deciding the subjects of my research, I chose to decide one grade level to focus on even though I do work with the entire Lower School population. I decided to conduct my research with third graders in my Spanish specialist classroom. The purpose of this research is to determine if mindfulness teaching and outdoor learning can improve the academic and behavioral outcomes of students with attention issues in the classroom, both diagnosed and undiagnosed.

Theoretical Framework

In 2016, The Framework for 21st Century Living was published by the Partnership for 21st Century Learning (P21). In this framework, students' future success is the main goal. There are three areas that are central to this idea: information, media, and technology skills; learning and innovation skills; and life and career skills (P21, 2016). These skills are not meant to stand alone, but to be integrated into the learning done in the classroom to help students be successful members of society in today's world. 21st Century Skills Theory states that students who learn these skills during their education are more engaged during their learning and more prepared for life after they graduate (P21, 2016).

Self-efficacy is defined by Bandura (1997) to be people's beliefs in their capabilities to exercise control over their own functioning. According to Bandura's theory, he believed that having high self-efficacy has been linked to resilience to adversity and stress, healthy lifestyle habits, and educational achievement (Bandura, 1997). There were four ways that Bandura thought people could improve their self-efficacy- mastery experiences, vicarious experiences, social persuasion, and emotional states (Bandura, 1997).

Both of these theories focus on students' skills that go further than the classroom. In this research, students with attention issues are being studied to see how they can best learn to refocus their attention when needed, in order to improve both their behavioral and academic outcomes. The skills the students are learning during the research align well with the life and career skills outlined in the Framework for 21st Century Living (2016). Throughout this research, students were asked to do mindfulness activities repeatedly, making them more successful as time went on. This idea aligns with the "mastery experiences" idea from the self-efficacy theory because as students did more mindfulness activities, they improved on their ability to self-regulate, which helped their stress levels and achievement in the classroom.

Review of Literature

This literature review will explore research about students with Attention Deficit Hyperactivity Disorder (ADHD) and the increasing problem of children coming to school with generalized attention challenges. In the following paragraphs, the differences between ADHD and undiagnosed attention issues are clarified, the reason behind the increase of issues is discussed, and ways to support these problems are given based on research. The research will encourage the use of outdoor education and mindfulness practices in elementary classrooms.

ADHD and Undiagnosed Attention Issues

According to Dr. Parekh (2017) from the American Psychiatric Association, "ADHD is one of the most common mental disorders affecting children". On the American Psychiatric Association's website, the two most prominent symptoms of ADHD are inattention and impulsivity (Parekh, 2017). These symptoms often have negative impacts on students' academic success (Daley & Birchwood, 2010). Students with ADHD have been found to have lower

grades, lower standardized test scores, and a higher chance of repeating a grade (Daley & Birchwood, 2010).

While almost 9% of all children are diagnosed with ADHD, there remain students who come to school with symptoms very similar to this disorder, but a doctor has not diagnosed them. Beyens et al. (2018) synthesize the research done in two meta-analyses from Nikkelen et al. (2014) and Ferguson et al. (2015) that state that there has been a continuous increase in the number of ADHD-related symptoms in students during the past four decades. These symptoms that are continuously rising include attention issues, impulsivity, and hyperactivity.

Reasons for Increase in Symptoms

There may be many reasons why the number of students with ADHD and related symptoms continues to rise. The two reasons that came up most frequently in the research are an increased amount of screen time using technology (Bickham et al., 2018; Beyens et al., 2018; Gentile et al., 2012) and parents that are less involved in their children's lives (Ansari & Crosnoe, 2016; Lauricella et al., 2015). There is no question that students are being introduced to technology and screens at a young age and for long. Both Gentile et al. (2012) and Beyens et al. (2018) find that specifically, video games and large amounts of screen time cause this increase in the amount of ADHD-like symptoms in our students. In both of these studies, it is found that the excitement and attraction of video games and social media have created an increasing amount of hyperactivity and impulsivity in children. The "arousing and fast-paced nature of contemporary screen media entertainment" has been attributed to the increase of the diagnoses (Beyens et al., 2018, p. 9875). Students can play games or browse social media platforms with little-to-no wait time or time without having stimulation, causing them to desire that same experience in their real lives. Gentile et al. (2012) go further to say that it is not only the excitement and attraction of

video games but the fact that they are replacing time that could be spent with activities that could allow for greater development. Where kids would have previously had something like playing outside, creating art, playing an instrument, reading, etc. to fill their time, they are now filling with video games and social media, which is causing these ADHD related symptoms to occur more prevalently (Gentile et al., 2012). In a study conducted by Bickham et al. (2018) in an elementary school, students with ADHD related symptoms who lowered their screen time at home had greatly improved academic and behavioral outcomes at school, thus supporting the conclusions of Beyens et al. (2018) and Gentile et al. (2012).

Looking at the study by Bickham et al. (2018), it is deemed necessary to have the support of families at home in order to reduce screen time. This is supported by research done by Lauricella et al. (2015), which found that children's screen usage is often a reflection of their parents' screen usage. Ansari and Crosnoe (2016) have found that the rise in ADHD-related symptoms, especially hyperactivity, in students could be stemming from parents that are less involved in their children's lives. This lesser involvement allows for more screen time and more ADHD-related symptoms for children. Parents who are of lower socioeconomic status or have mental health issues may require their children to use more screens to act as a distraction or caretaker while working (Ansari & Crosnoe, 2016). It is evident from the research previously mentioned that ADHD and ADHD-related symptoms are on the rise, primarily due to the increase of social media and screens. In a national study done by DuPaul et al. (2019, p. 1303), it was found that "at least one in every five students with ADHD do not receive school services despite experiencing significant academic and social impairment". While teachers cannot stop the increase of these issues, it is imperative that they have classroom interventions to serve this increasing population of students with ADHD-related symptoms well.

Interventions for ADHD Related Symptoms

Research has shown that the symptoms of ADHD can be improved by spending time outdoors (Bowler et al., 2010; Naeini et al., 2019; Amoly et al., 2014) and using mindfulness strategies (Xue et al., 2019; Britton et al., 2014). There are multiple ways that the research shows that outdoor education can help improve ADHD-related symptoms. According to Naeini et al. (2019) in a randomized study, getting higher amounts of vitamin D has been shown to reduce ADHD symptoms. There are many ways to increase vitamin D levels. In the study, randomized students with ADHD were given vitamin D supplements to see how it would affect their symptoms. The students with the vitamin D supplements not only improved some of the students' behavioral issues, but it even prevented the worsening of symptoms (Naeini et al., 2019). In the conclusion of this study, it is mentioned that although the study they did was using vitamin D supplements, similar effects can be seen by minimally raising vitamin D by being outdoors more often.

Bowler et al. (2010) echo this sentiment that being outdoors can help improve symptoms of ADHD and goes even further to say that being outside helped not only students with ADHD symptoms but all students. In this study, there were positive effects on students physically and mentally when they spent more time outdoors (Bowler et al., 2010). Amoly et al. (2014) did a study to find which setting was best for improving behaviors related to ADHD. Their study of students ages 7-10 from 36 Barcelona schools, found that it was clear that outdoor lessons had much more significant improvements on ADHD symptoms than lessons taught in the classroom. They then took it further to find which kind of outdoor space was most beneficial for these students; blue or green spaces. They taught lessons in both grassy areas and by the ocean to test which setting students with ADHD would respond to best. It was found that, by far,

ADHD-related behaviors were most improved when the students learned in a green space (Amoly et al., 2014). This study allows teachers to think even further about the setting in which they teach their students and what helps them succeed.

While the research supports outdoor education as a successful intervention for students with ADHD symptoms, there is also support for mindfulness practices as an intervention that can help students with ADHD. In a meta-analytic study of 682 participants done by Xue et al. (2019), it was found that mindfulness interventions could significantly reduce core ADHD symptoms. Although they did not outline the specific mindfulness-based interventions (MBIs) that they performed, it was defined that MBIs are "a type of cognitive training which can improve attention and self-regulation abilities " (Xue et al., 2019). They found that when people with ADHD can make themselves cognitively aware of the symptoms they are experiencing and have tools to self-regulate, both hyperactivity and impulsivity are improved. These ideas were supported in a randomized study done by Britton et al. (2014) using 101 sixth-grade students. In this study, it was found that mindfulness interventions helped students with internalizing problems, externalizing problems, and attention problems (Britton et al., 2014).

Discussion and Conclusion

In conclusion, the research has supported that ADHD and ADHD-related symptoms indicate that these issues are exponentially increasing (Beyens et al., 2018; Nikkelen et al. 2014; Ferguson et al., 2015) and being exacerbated by the increase of technology and screen usage (Bickham et al., 2018; Beyens et al., 2018; Gentile et al., 2012). It was shown in the studies done by Bowler et al. (2010), Naeini et al. (2019), and Amoly et al. (2014) that incorporating outdoor education into the classroom has positive effects for students with ADHD and other attention challenges. It was also supported in studies done by Xue et al. (2019) and Britton et al. (2014)

that by adding mindfulness interventions in their classroom, a teacher can expect to see improvements in ADHD-related symptoms in children.

Methodology

This action research project was conducted to evaluate the effectiveness of outdoor education and mindfulness practices on students with attention issues. For triangulation purposes, both qualitative and quantitative data were collected. Qualitative data was collected through field notes and observations of students' behavior, and quantitative data was taken by data tracking, test scores, and pre and post-surveys.

The research was conducted in third-grade Spanish specialist classrooms at a private school in Minneapolis, MN. One of the classrooms did not receive interventions to have a controlled variable to compare with the research. The other third-grade classroom did receive the outdoor education and mindfulness practice interventions. In the intervention classroom, there were ten girls and nine boys as seen in Table 1. Although the literature review proved that students today generally have more attention issues because of the lifestyle changes that have occurred, data was collected to see the number of students who have overt problems with their attention in class. Based on information gathered from medical diagnoses and former teachers, there were nine students with attention issues in the research class. The researcher has a bachelor's degree in elementary education and is a Spanish specialist teacher.

Table 1

Breakdown of Classroom Populations

Class:	Girls:	Boys:	Attention Issues:
Intervention Class	10	9	9
Control Class	11	8	6

A pre-survey (see Appendix A) and post-survey (see Appendix C) were administered to students in both classes to determine if the research findings were consistent with the class information. These surveys asked students questions on a scale of 1-5 about their amount of screen time/technology use at home, how easy it is for them to focus during class time, and how well they know how to get themselves to refocus when they get distracted. The following week after the pre-survey, the interventions began, and the data tracking began. A Google Form was filled out after each class period to track both classes' behavior (see Appendix B). The number of smiley faces the classes received on their exit slips for classroom teachers was recorded. This was important to track any changes, positively or negatively, in the students' behavior as a whole. Students had the opportunity to receive four smiley faces each class. One for entering quietly, one for participating in the class activities, one for following directions, and one for leaving quietly. During the interventions, student observations and field notes were also taken by the researcher to get more personalized data for the students who were identified as having attention problems. Lastly, at the end of the intervention period, a unit test was administered to students and their scores were recorded to see any academic benefits that the intervention class gained.

The first step the students participated in was the pre-survey on Google Forms (see Appendix A). Students completed this survey with no prior knowledge given by the researcher. After the survey was completed by all students, the researcher gave a brief explanation of the class' future mindfulness and outdoor education lessons. The following class period, one week later, the students did their first mindfulness practice at the beginning of class time. Students were asked to find a comfy place to lay or sit where they could relax. During the first practice, students were only asked to be quiet for two minutes. They were asked to think about how they

feel currently; physically, mentally, and emotionally. They were asked to forget about anything that had happened previously in the day or anything that would happen in the future, and they were to just focus on their current state. Each week, the time went a minute longer as students became more comfortable with the practice of mindfulness and the quiet minds and bodies. During these minutes of mindfulness practice, the researcher took observations of the nine students previously identified as having attention issues and general observations of the class as a whole. After the mindfulness practice, students were instructed to come back to their table spots. A few minutes of direct instruction would happen in the classroom before the researcher took the students outside to participate in the lesson activity outdoors for approximately twenty minutes each time. Field notes and observations were also made during the outdoor activity. The intervention class continued these two processes each class period, once a week, for six weeks. After each class period, the researcher would collect data on whether or not there were any students who received a Discipline Referral, a consequence of a major negative behavior, during the class (see Appendix E). The researcher would also complete a Google Form to keep track of how many smiley faces the class received on their exit slip that was given to their classroom teacher (see Appendix B). During the last week of research, the students participated in their usual mindfulness practice at the beginning of class and then took their unit test (Appendix D). During the following week's class time, students were given a post-survey to complete with the same questions as the pre-survey to see if their feelings and experiences had changed since the beginning (Appendix C).

Analysis of Data

There were both quantitative and qualitative data points taken throughout the research. For the qualitative data, the data was in the form of short statements taken by the researcher

when completing field notes and by students when completing surveys. Thematic analysis and coding were done on this data in order to pull data points out of the statements that were taken. Quantitative data was taken in the form of test scores, various survey questions, and behavior inventories. The quantitative data were analyzed using measures of central tendency to show a comparison between the two research classrooms.

Report of Findings

The purpose of this research was to evaluate the effectiveness of mindfulness practice and outdoor education on students with attention issues. The research was aiming to evaluate both the academic and behavioral changes in the students throughout the six weeks of research. During the pre-survey given to the students, it was also attempted to observe whether there was a correlation between the amount of screen time students had at home and the difficulty they had with paying attention in class, as was brought up in the review of the literature. The research was done and data was collected at the beginning of the school year during the first six weeks. There was data taken from two third-grade classrooms at a private school in the Twin Cities area. There were seventeen students in each class; a combined total of thirty-four students. One classroom participated in the research interventions while the other will be used as a constant to compare data. The research was conducted in a Spanish specialist classroom that meets with students once a week for seventy-five minutes at a time.

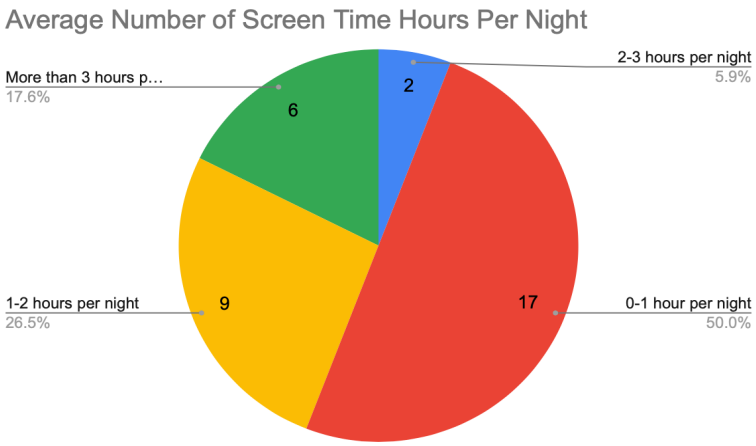
Screen Time and Attention

The first question that this research addressed dealt with seeing if there was a correlation between the amount of screen time students had at home and the degree of difficulty they have paying attention at school. The literature that was reviewed proposed that students who use more screen time have a harder time paying attention in class. In the pre-survey that was given to

students in both classes, they were asked how many hours of screen time they have, on average, per night (Appendix A). Students were given examples of cell phones, iPads, tablets, television, and video games as things that counted as screen time. As seen in Figure 1, there was a large range of the amount of screen time across the students, with the majority of students having little to no screen time.

Figure 1

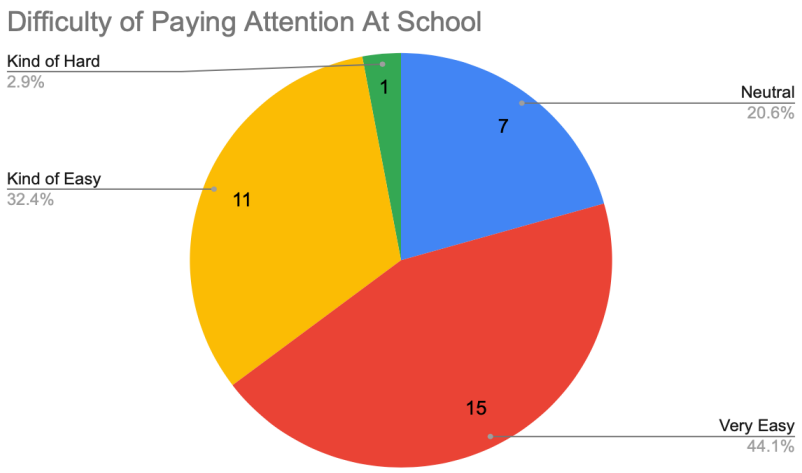
Results for Amount of Screen Time Per Night



Students were then asked to determine how hard it is for them to pay attention at school. Because the students were third graders, easy language was used to ensure all students were able to understand the questions and responses with ease. The options were: very easy, kind of easy, neutral, kind of hard, and very hard. Figure 2 shows the results of this survey question. The results show data that closely correlates with the data from Figure 1.

Figure 2

Results for Difficulty of Paying Attention at School



While this data does not prove that screen time has an effect on the ability to pay attention, it does suggest that the students at the research school reveal the same correlation as was given in the research.

Behavioral Data

To look at the behavioral data of the students, performance data was tracked, students were surveyed, and field notes were taken. After each class period together, the researcher kept track of the number of smiley faces each class earned on their exit ticket that was passed to their classroom teacher (Appendix B). There were four potential smiley faces that the classes could earn. One was for entering the room quietly, one was for following directions well during class time, one was for giving effort, and one was for lining up quietly at the end of class. The researcher also kept track of which smiley face(s) the students missed. Data was taken from both the intervention and constant classrooms during the six weeks to evaluate if the interventions were allowing for more growth in the intervention classroom. Figure 3 shows the results of this data for the students who were in the constant classroom.

Figure 3

Smileys Earned by Class with No Interventions

Week Number	Number of Smileys Earned	Smileys Missed
1	1	Entering, Following Directions, Lining up
2	1	Entering, Following Directions, Lining up
3	2	Entering, Following Directions
4	2	Entering, Lining Up
5	2	Entering, Following Directions
6	2	Entering, Following Directions

There was very little growth in their behavior during the six weeks. The two biggest problem areas for this classroom were entering the classroom quietly and following directions well throughout class time. Figure 4 shows the results for this data point in the classroom that had the outdoor education and mindfulness interventions.

Figure 4

Smileys Earned by Class with Interventions

Week Number	Number of Smileys Earned	Smileys Missed
1	1	Entering, Following Directions, Lining up
2	2	Entering, Following Directions
3	2	Entering Following Directions
4	3	Following Directions
5	4	

6	3	Lining Up

The intervention classroom showed some steady growth as the six weeks progressed. In week five, they earned all four smiley faces. The biggest problem area for this classroom was following directions consistently during class time. After week three, this classroom did not miss any smiley faces for entering quietly whereas the other class continued to miss that one all six weeks.

In the research school, discipline referrals are given to children who have a serious behavioral incident in a classroom. The researcher kept track of any discipline referrals that were given during the six weeks of research. As seen in Figure 5, there was only one discipline referral given out in the six-week research period. A student in the intervention class was given a discipline referral during class on week four.

Figure 5

Discipline Referrals Given

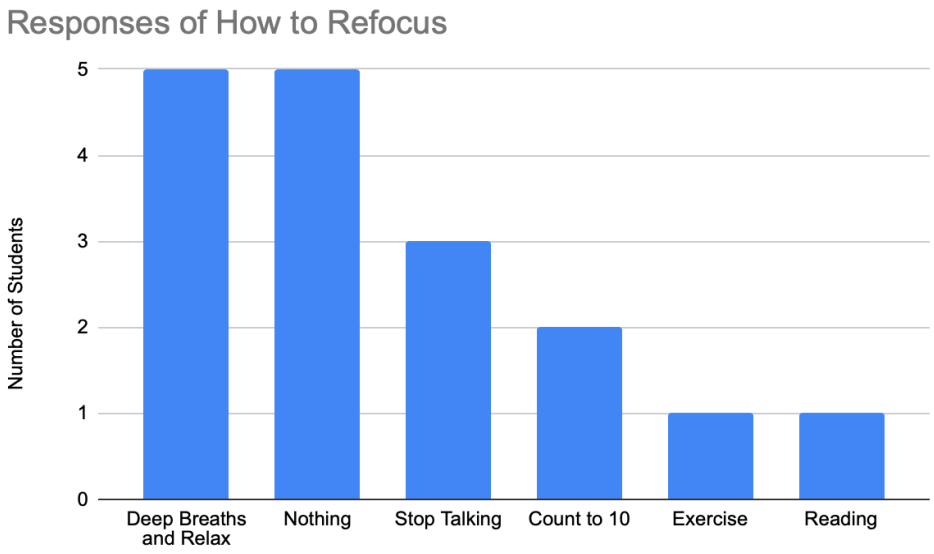
Class	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Intervention	0	0	0	1	0	0
Constant	0	0	0	0	0	0

In both the pre-and post-survey, students were asked to give open-ended responses to how they calm themselves down when they can feel themselves not paying attention in class. This data was analyzed and categorized. Figure 6 shows the responses gathered from students in the pre-survey before any interventions were started. The two most common responses were taking deep breaths and doing nothing. There were five students who responded for each of

these, making up the majority of the class. The rest of the class responded that they stop talking, count to ten, read, or do an exercise.

Figure 6

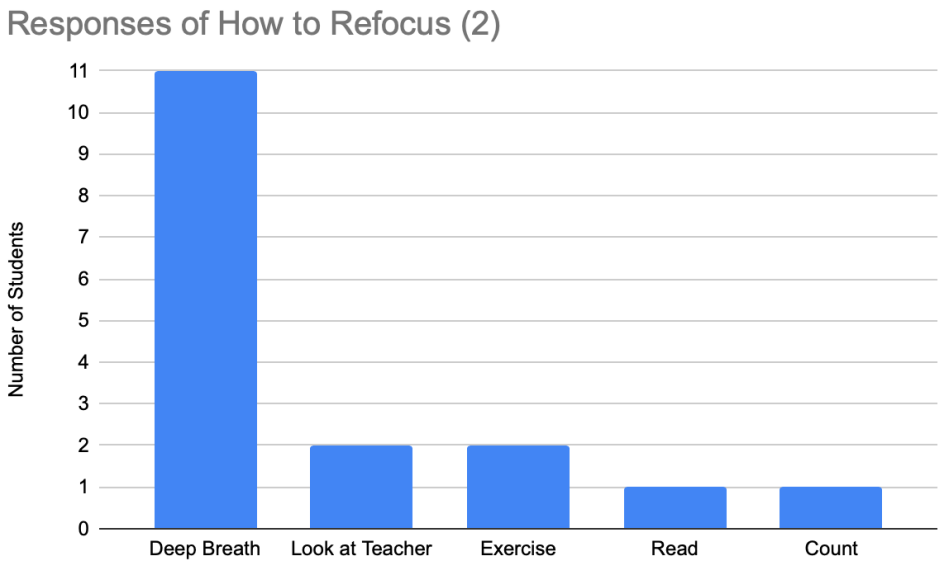
Survey Response of How Students Refocus Themselves During Class: Pre-Survey



After the six weeks of research and intervention were complete, the students completed a post-survey. This survey asked the students the same question; what do you do when you feel yourself not paying attention during class. Figure 7 shows the data points for the results of this question.

Figure 7

Survey Response of How Students Refocus Themselves During Class: Post-Survey



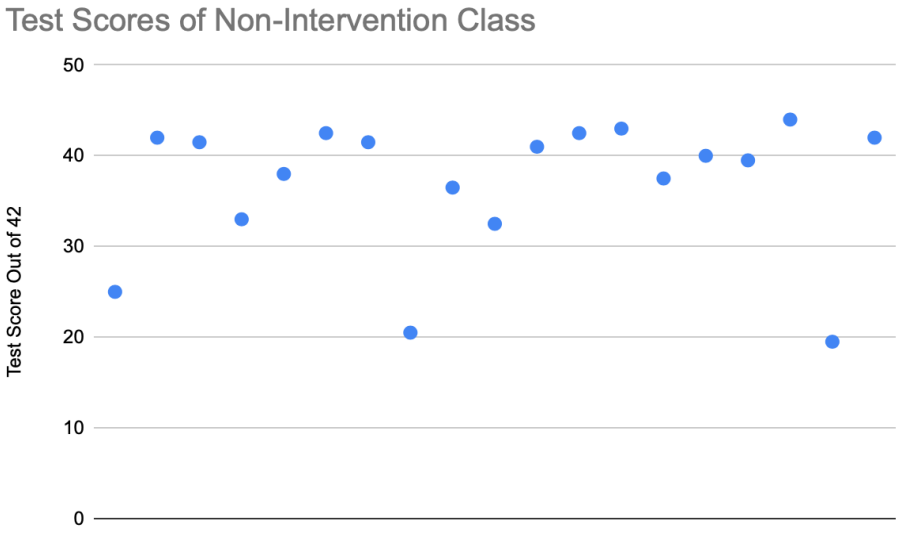
During the post-survey, there were no students who said they did nothing when they could feel themselves not paying attention. The most common answer, by far, was taking deep breaths. Eleven students responded with that answer. The other responses either had two or one student response. These responses were similar to the responses given in Table 6.

Academic Data

The final exam that was given to students was the main data source for observation of the academic improvement of the students during the research. Both the intervention class and the constant class were given the same test and each class was given the same instruction and activities. The only difference between the two classes was the inclusion of mindfulness practices and learning outdoors in the intervention classroom. The test was out of forty-two points, but there were two points of extra credit available. Therefore, there were some students who scored up to forty-four points. Figure 8 shows the results of the exam for the students in the constant classroom with no interventions.

Figure 8

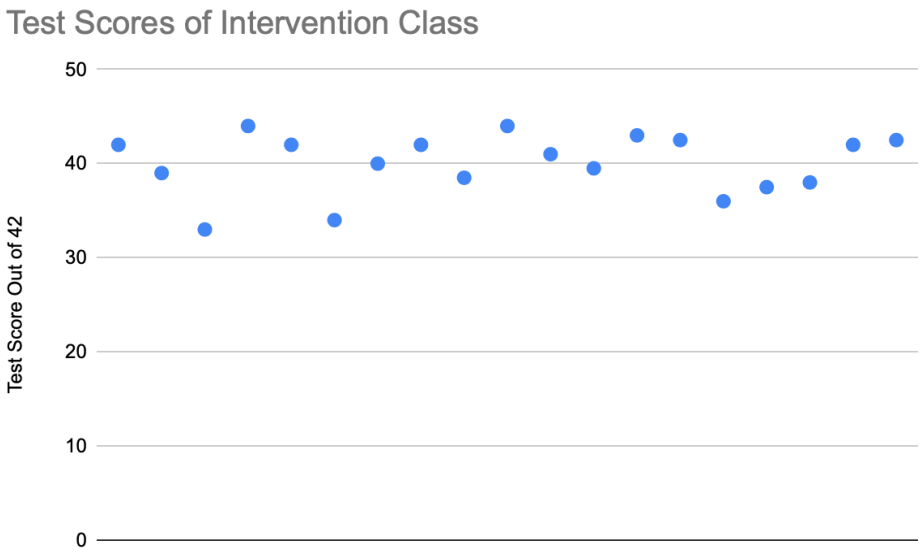
Test Scores of Non-Intervention Class



There were many students who scored near the perfect-score mark. There were three students who were outliers, all scoring less than thirty points. Figure 9 shows the data points for the results of the exam for the intervention class.

Figure 9

Test Scores for Intervention Class



Most of the students in the intervention class scored close to a perfect score, or higher. There were no outliers in this data. When comparing the two classroom's data against each other, Figure 10 shows the central measures of tendency of each data set.

Figure 10

Central Measures of Tendency for Test Scores of Both Classes

Class	Mean	Median	Maximum	Minimum
Constant	37	40	44	19.5
Intervention	40	41	44	33

While the median, and maximum of the two data sets were almost identical, the minimum scores were very far apart. The three outliers in the non-intervention class forced the mean to be a little lower than the mean of the intervention class. All of the data points listed above can be examined to come up with an action plan to put into place after the research is finished.

Conclusion and Recommendations

The purpose of this research was aiming to find if outdoor education and mindfulness practices would help students with attention issues in the classroom, both academically and behaviorally. Although the students with diagnosed and previously documented attention issues were identified at the beginning of the research, all of the students in the class were recorded in the data because of the generalized attention issues our students are facing in recent times (Beyens et al., 2018; Nikkelen et al., 2014; Ferguson et al., 2015). The data points that were taken were: a pre-survey and post-survey, field notes by the researcher, tracking of exit slips, and the unit exam scores.

Each class period, the students participated in both a mindfulness practice and an outdoor lesson. At the beginning of the research, students were not thrilled about having to sit quietly

during their mindfulness practice, and it was quite troublesome to get them to engage appropriately. There were often silly noises, exaggerated deep breathing, and whispering. However, as the weeks progressed, students became excited for the practice and asked if there could be additional time added to continue doing it. The students got more calm each week and, by the end of the six weeks, they were doing the full mindfulness practice while being engaged and quiet. There were multiple students who asked if this practice could be continued even after the research was done.

The outdoor education was always exciting for the students, so the only problem with this aspect was ensuring the students were doing the intended activities outside. There can be a mindset switch when students step outside of the classroom, so it was important to reinstate the rules and procedures that would be followed in the outdoor setting. After the first couple of weeks, these issues were hammered out and the students really enjoyed spending time learning outside.

In the pre-survey taken by students, the goal was to gauge students' knowledge of these interventions and see where they were starting off. Looking at the data, eight students said in their pre-survey that paying attention is not easy for them at school (see Figure 2). Many students did not have a positive tool for how they could refocus their attention during class (see Figure 6). There were five students who had no tool that they used at all, and other students gave answers that should not be used during a lesson, such as reading or exercising. There were eight students who already stated in the pre-survey that they had healthy tools, like deep breaths and counting, to refocus (see Figure 6). However, after the six weeks of intervention, fourteen of the students had a healthy tool and there were no kids who said they didn’t have a tool they use (see Figure 7). This growth was huge because it showed the students’ independent growth and understanding

of the mindfulness practices. These tools most likely helped in their behavior tracking throughout the research as well.

One behavior tracking data point taken was the exit slips of both classrooms each week (see Figures 3 and 4). It was clear that the intervention classroom's behavior improved steadily while the non-intervention classroom stayed about the same for the six-week period. By looking at the data in Figure 4, it can be seen that the students in the intervention classroom were able to earn their "entering quietly" smiley faces each week after week three. One reason for this change seemed to be that the students were enthusiastic to get to their mindfulness practice, and the students knew they would get to it faster if they came in quietly. There were a few leaders of the classroom that would remind the other students to come in quietly so that they could begin mindfulness, which usually had an effect on the entire class. For the last two weeks, when the mindfulness practice was done, the lights would stay off for a few minutes while students transitioned into their next activity. Moving quietly and calmly into the next activity set the students up for success, which may have allowed them to earn their "following directions" smiley face for the last two weeks.

To track academic progress, the scores of the unit test were recorded for both classrooms (see Figures 8 to 10). Besides the minimum test score, the central measures of tendency were fairly similar between the intervention class and the non-intervention class, not showing any proof that these interventions helped improve the academic performance of the students. One reason this is the case may be that the students only received these interventions once a week for a seventy-five-minute period. While the behaviors could be improved short term, the academics were not as affected by these short interventions.

It was also a secondary goal of the research to establish whether or not the research done by Bickham et al. (2018) and Gentile et al. (2012) was proven true in this context as well. In these studies, it was found that students who used screens more often at home had a harder time paying attention. Although there was not a lot of data to support this statement, the data taken during research seemed to agree with the study (see Figures 1 and 2). This information was not surprising. There are multiple students in the classrooms that seem to be obsessed with their iPad, and they need to be given multiple reminders to put them away or do what they are supposed to while using them.

One weakness of the study was that there were many data points collected based on behavior while there was only one taken for the academic data. Being that the research could only take place during the allotted class time of seventy-five minutes once per week, there was only a brief amount of time to complete both lessons and the research interventions. The data could have benefited from adding a pre-test at the beginning of the study to have more information to compare to.

In future studies, it would be helpful to use these interventions in a homeroom setting where they could be used on a more regular basis. There was a limitation with the time constraint of a specialist classroom. The way that these interventions may be most beneficial to students would be to have a whole-school change to using these interventions. The consistency and frequency would allow for much more growth than the sparse nature of this study. Overall, outdoor education and mindfulness practices did prove to benefit students with attention issues behaviorally and could potentially improve academic performance with more frequent intervention.

References

Amoly, E., Dadvand, P., Forns, J., Lopez-Vicente, M., Basagana, X., Julvez, J., Alvarez-Pedrerol, M., Nieuwenhuijsen, M. J., & Sunyer, J. (2014). Green and blue spaces and behavioral development in Barcelona schoolchildren: the BREATHE project. *Environmental Health Perspectives*, *122*(12), 1351. https://link.gale.com/apps/doc/A398253374/EAIM?u=clic_stkate&sid=bookmark-EAIM&xid=c70bf034

Ansari, A., & Crosnoe, R. (2016). Children's hyperactivity, television viewing, and the potential for child effects. *Children and Youth Services Review*, *61*, 135–140. https://doi.org/10.1016/j.childyouth.2015.12.018

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: Freeman.

Bickham, D. S., Hswen, Y., Slaby, R. G., & Rich, M. (2018). A preliminary evaluation of a school-based media education and reduction intervention. *Journal of Primary Prevention, 39*(3), 229-245. doi:http://dx.doi.org.pearl.stkate.edu/10.1007/s10935-018-0510-2

Beyens, I., Valkenburg, P. ., & Piotrowski, J. . (2018). Screen media use and ADHD-related behaviors: Four decades of research. *Proceedings of the National Academy of Sciences - PNAS*, *115*(40), 9875–9881. https://doi.org/10.1073/pnas.1611611114

Bowler, D., Buyung-Ali, L., Knight, T., & Pullin, A. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health*, *10*(1), 456–456. https://doi.org/10.1186/1471-2458-10-456

Britton, W., Lepp, N., Niles, H., Rocha, T., Fisher, N., & Gold, J. (2014). A randomized controlled pilot trial of classroom-based mindfulness meditation compared to an active control condition in 6th-grade children. *Journal of School Psychology*, *52*(3), 263–278. https://doi.org/10.1016/j.jsp.2014.03.002

Daley, D., & Birchwood, J. (2010). ADHD and academic performance: why does ADHD impact academic performance and what can be done to support ADHD children in the classroom? *Child : Care, Health & Development*, *36*(4), 455–464. https://doi.org/10.1111/j.1365-2214.2009.01046.x

DuPaul, G., Chronis-Tuscano, A., Danielson, M., & Visser, S. (2019). Predictors of receipt of school services in a national sample of youth with ADHD. *Journal of Attention Disorders*, *23*(11), 1303–1319. https://doi.org/10.1177/1087054718816169

Ferguson C. (2015). Do angry birds make for angry children? A meta-analysis of video game influences on children's and adolescents' aggression, mental health, prosocial behavior, and academic performance. *Perspect Psychol Sci,* 10:646–666.

Gentile, D., Swing, E., Lim, C., & Khoo, A. (2012). Video game playing, attention problems, and impulsiveness: evidence of bidirectional causality. *Psychology of Popular Media Culture*, *1*(1), 62–70. https://doi.org/10.1037/a0026969

Lauricella, A., Wartella, E., & Rideout, V. (2015). Young children's screen time: The complex role of parent and child factors. Retrieved from https://www.sciencedirect.com/science/article/pii/S0193397314001439

Naeini, A., Fasihi, F., Najafi, M., Ghazvini, M., & Hasanzadeh, A. (2019). The effects of vitamin D on ADHD (Attention Deficit Hyperactivity Disorder) in 6–13-year-old students: A randomized study. *European Journal of Integrative Medicine*, *25*, 28–33. https://doi.org/10.1016/j.eujim.2018.10.00

Nikkelen, S., Valkenburg, P., Huizinga, M., & Bushman, B. (2014). Media use and ADHD-related behaviors in children and adolescents: A meta-analysis. *Developmental Psychology, 50*(9), 2228-2241. doi:http://dx.doi.org.pearl.stkate.edu/10.1037/a0037318

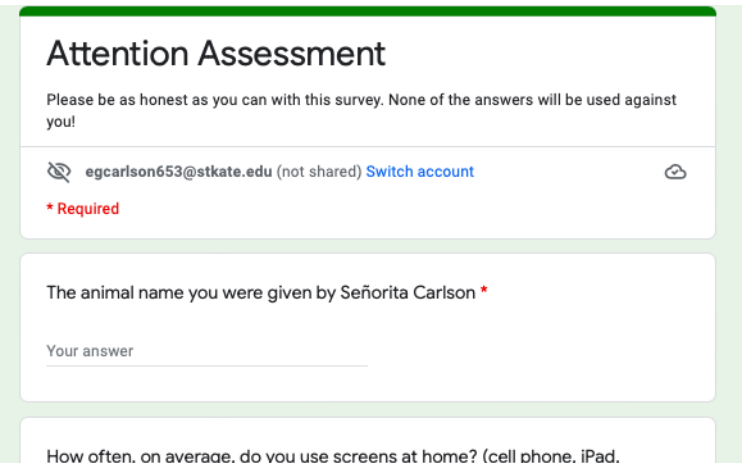
Parekh, R. M.D. (2017). What is ADHD? Retrieved June 23, 2021, from https://www.psychiatry.org/patients-families/adhd/what-is-adhd

Partnership for 21st Century Learning. (2016). Framework for 21st Century Living. Retrieved from: http://www.p21.org/storage/documents/docs/P21_framework_0816.pdf

Xue, J., Zhang, Y., & Huang, Y. (2019). A meta-analytic investigation of the impact of mindfulness-based interventions on ADHD symptoms. *Medicine (Baltimore)*, *98*(23), e15957–e15957. https://doi.org/10.1097/MD.0000000000015957

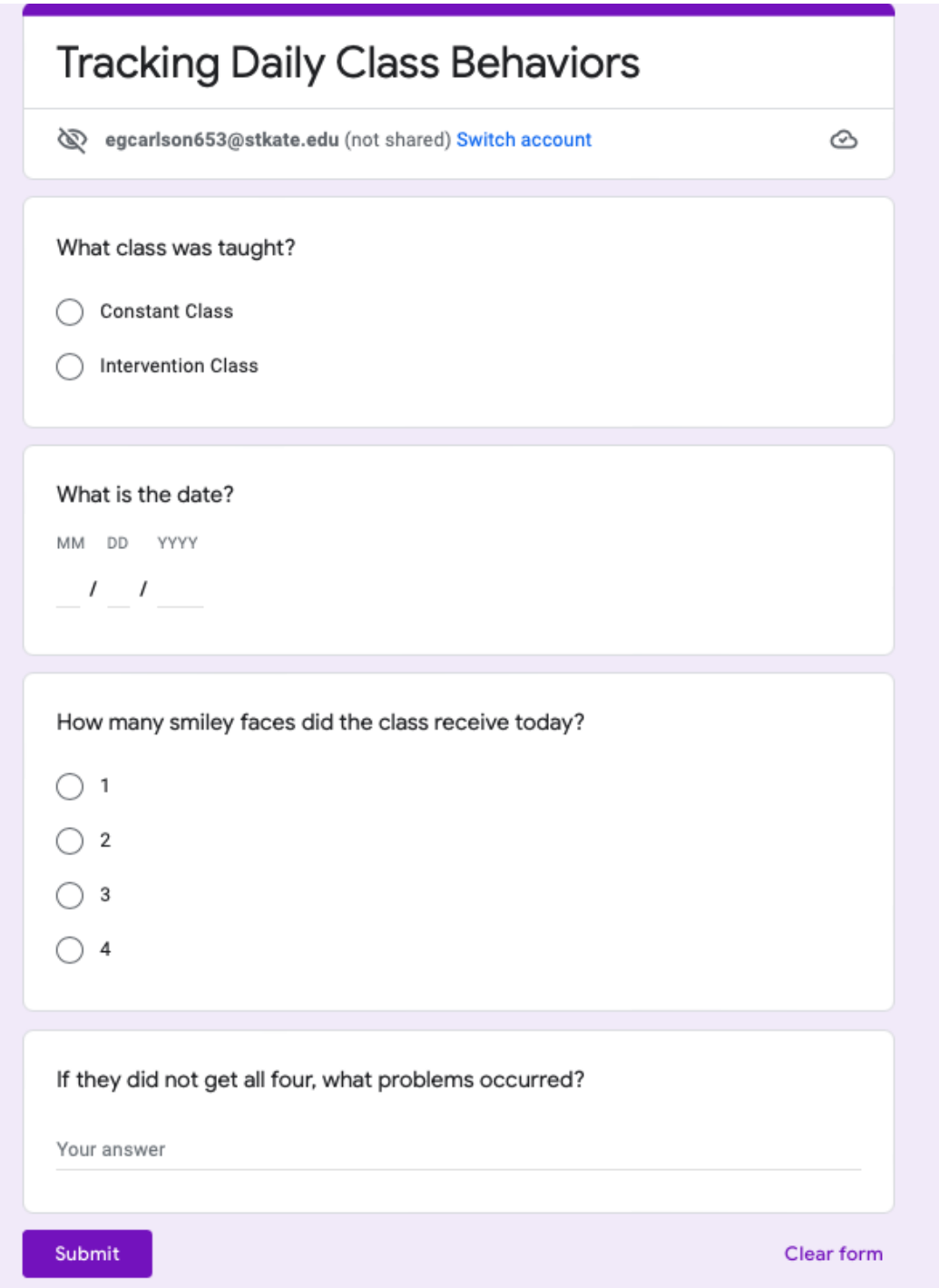
Appendix A

Pre-Intervention Survey



Appendix B

Behavior Tracking Google Form



Tracking Daily Class Behaviors

egcarlson653@stkate.edu (not shared) Switch account

What class was taught?

- Constant Class
- Intervention Class

What is the date?

MM DD YYYY

/ /

How many smiley faces did the class receive today?

- 1
- 2
- 3
- 4

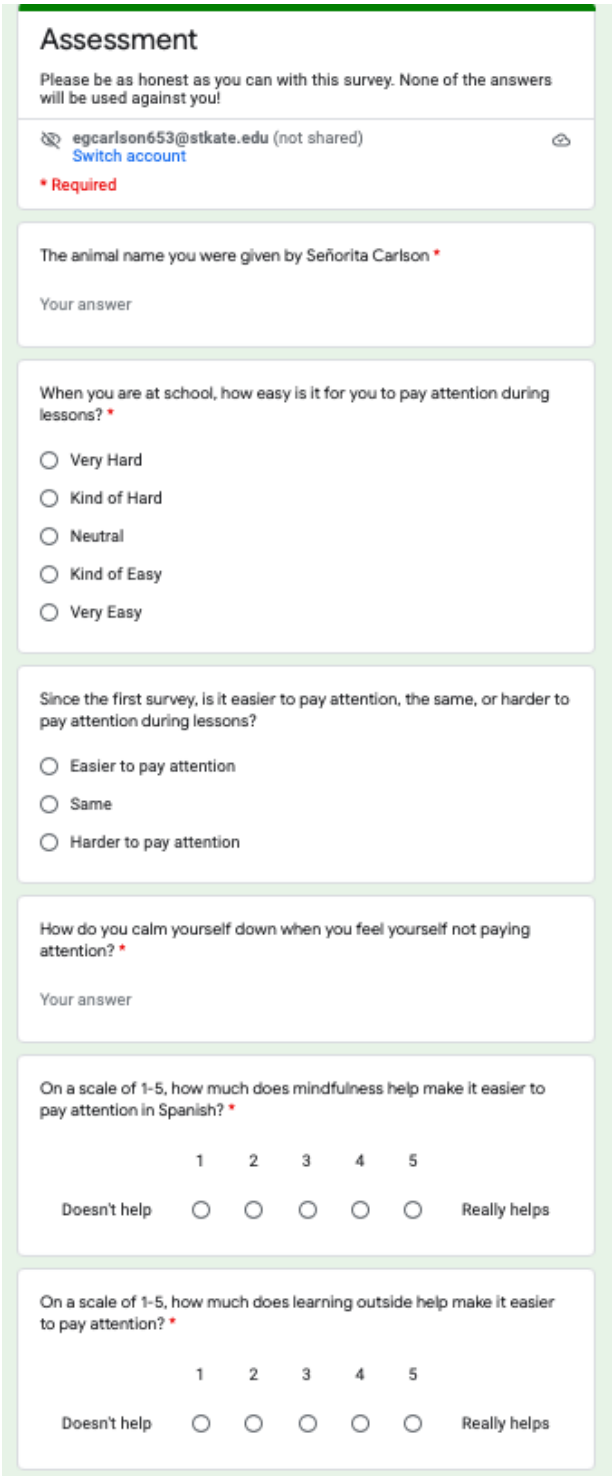
If they did not get all four, what problems occurred?

Your answer

Submit Clear form

Appendix C

Post-Intervention Survey



Assessment

Please be as honest as you can with this survey. None of the answers will be used against you!

egcarlson653@stkate.edu (not shared)
Switch account

* Required

The animal name you were given by Señorita Carlson *

Your answer

When you are at school, how easy is it for you to pay attention during lessons? *

- Very Hard
- Kind of Hard
- Neutral
- Kind of Easy
- Very Easy

Since the first survey, is it easier to pay attention, the same, or harder to pay attention during lessons?

- Easier to pay attention
- Same
- Harder to pay attention

How do you calm yourself down when you feel yourself not paying attention? *

Your answer

On a scale of 1-5, how much does mindfulness help make it easier to pay attention in Spanish? *

	1	2	3	4	5	
Doesn't help	○	○	○	○	○	Really helps

On a scale of 1-5, how much does learning outside help make it easier to pay attention? *

	1	2	3	4	5	
Doesn't help	○	○	○	○	○	Really helps

Appendix D

Unit Test

Spanish Test 1: Nombre: _____

1. Write the days of the week in order:

Sabado Martes Domingo Miercoles Lunes Viernes Jueves

1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____

2. Write what season is explained:

Primavera Invierno Otoño Verano

What season do the leaves turn colors and fall off the trees? _____

What season do we not have school and you can go swimming outside? _____

What season is there snow and it is very cold? _____

What season does it rain a lot and flowers start to grow? _____

3. Label members of the family in the picture below:

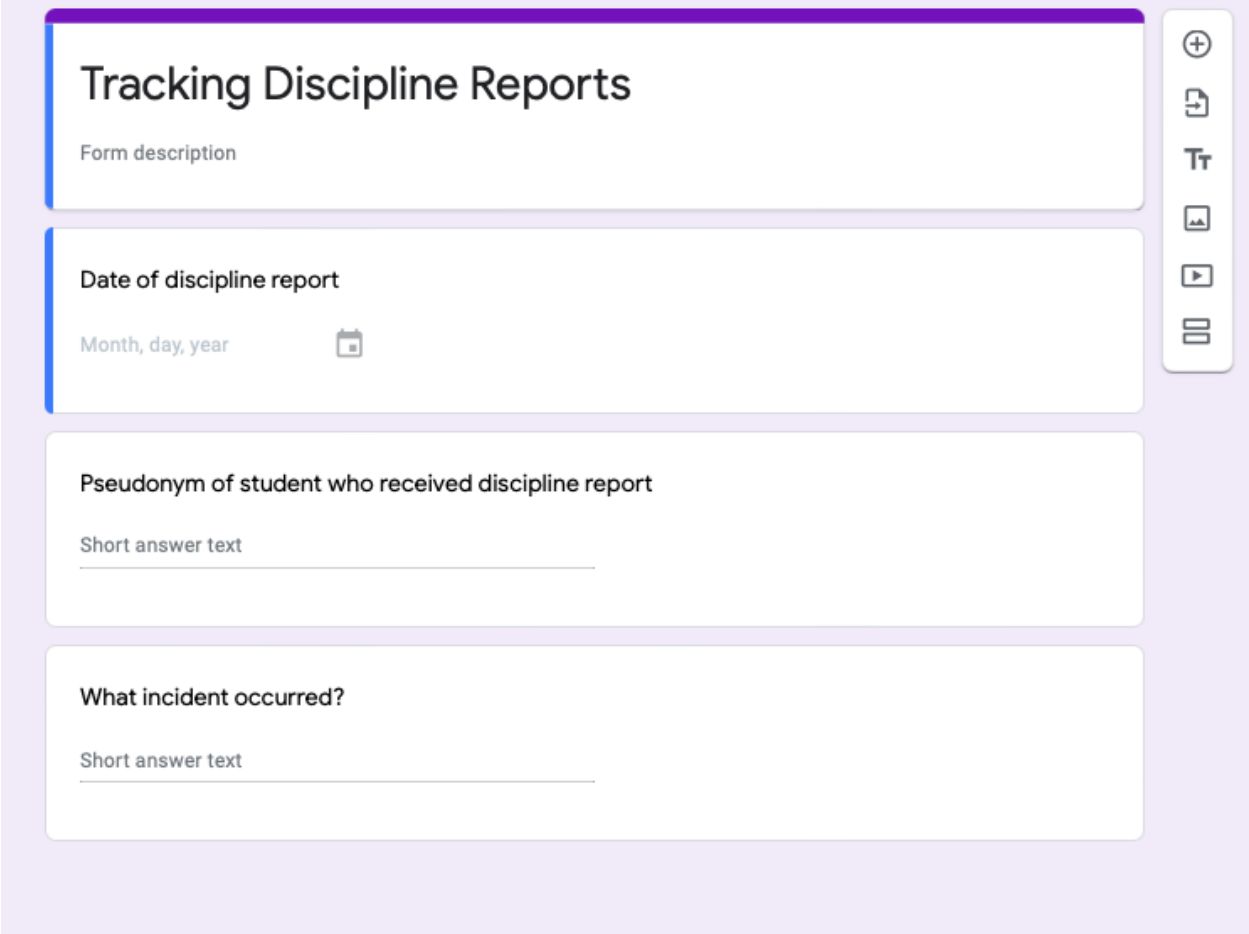
La Cara: Label the face with the correct words in Español.

WORD BANK

Ojos
Nariz
Oreja
Boca
Dientes

Appendix E

Discipline Report Tracking


Tracking Discipline Reports
Form description
Date of discipline report
Month, day, year
Pseudonym of student who received discipline report
Short answer text
What incident occurred?
Short answer text