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Evaluation Study: Classroom Behavioral Interventions



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FRONTIER 21 Education Solutions

Evaluation Study of the Impact and Implementation of Fun and Function's Classroom Behavioral Interventions

Independently conducted by

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EXECUTIVE SUMMARY

Fun and Function, a company that designs and produces behavioral therapy tools for students with sensory needs, commissioned FRONTIER 21 Education Solutions to conduct an independent evaluation of the implementation and impact of one of its primary products, the Break Box. The Break Box is a “universal design” therapeutic intervention for students with behavioral issues that includes a kit filled with a variety of sensory tools designed to support students’ self-regulation. It is accompanied by teacher training on strategies for implementation and an online communication platform that allows teachers to discuss challenges and ideas related to the intervention. During the 2016-17 school year, the Break Box intervention was adopted in two urban school settings: District 75, which serves students with special needs within the New York City Public School system, and DCS, a large K-8 charter school in Philadelphia. The purpose of this evaluation was to examine issues around the implementation of the Break Boxes and to explore the extent to which students improved on multiple behavior measures during the intervention, both in special education classrooms and in an integrated whole-school context.

This report presents several promising preliminary findings regarding the benefits of the Break Box intervention. During an intensive 10-day implementation in District 75’s special education classrooms, students demonstrated a 59% reduction in the average frequency of incidents requiring disciplinary action per day, and 94% of participating special education teachers reported that the intervention was helpful and meaningful in their classrooms. At DCS, all K-5 classrooms participated in the Break Box intervention, and teachers used the toolkit with both regular and special education students as they saw fit. Teacher surveys and student behavior data were collected at two points—once at the beginning of implementation and once after teachers had used the intervention for several months. The majority of participating teachers (88%), reported that the intervention was effective in their classrooms by the end of the implementation period. The most common challenge with implementation reported by teachers was managing the use of the Break Box without disrupting learning. The overall student body demonstrated a decrease in the frequency of serious disciplinary incidents, but an increase in the frequency of minor disciplinary incidents. However, special education students at DCS exhibited significantly greater reductions in the frequency of minor disciplinary incidents compared to regular education students, with 50% of special education and 27% of regular education students showing improvements over the implementation period.

This study was limited in several ways, including the inclusion of students with types of behavioral needs not likely to be addressed by Break Boxes in the study samples, and the collection of some more general discipline data in the whole school intervention that may not be the direct target of this type of intervention. The findings presented here should be viewed as a valuable “first step” in developing a deep understanding of how schools and classrooms can make the best use of these types of “universal design” behavioral interventions.

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Introduction/Purpose of the Research

Fun and Function, a company that designs and produces behavioral therapy tools for individual children and for schools, commissioned FRONTIER 21 Education Solutions, an independent education research company, to evaluate the implementation and impact on student behaviors of one of its primary products in regular education and special education classroom settings. The product being evaluated was the Break Box. Two Break Box intervention studies were conducted in different types of urban public school settings—a Special Education Classroom Intervention study and a Schoolwide Classroom Intervention study. The Special Education Classroom study examined Break Box interventions with special education students in District 75 of the New York City Public School System. The Schoolwide Classroom study examined Break Box interventions conducted in regular classrooms with regular students and students with special education needs in grades K to 5 in a K to 8th grade charter school in Philadelphia. The studies had two main goals: to assess the impact of the Break Box on students who exhibit disruptive behaviors in different types of settings, and to gather information on the ways in which teachers and students used the Break Box and the conditions that support or inhibit its successful use.

Research Objectives and Methods

The objective of this research was to document how Fun and Function’s Break Box intervention (a.k.a., “Sensory-based behavioral Response to Intervention (RTI) program”) was implemented in special education and regular education settings, and the extent to which it can achieve meaningful results in those settings, within a relatively short intervention time (e.g., 2 to 10 weeks). FRONTIER 21 examined Fun and Function’s Tier 1 & 2 intervention conducted in District 75 in New York (a special education-only district that focuses particularly on students with severe disabilities, such as severe AD/HD and Autism Spectrum Disorder/ASD) and Schoolwide intervention in an urban charter elementary school in Philadelphia.

- **Fun and Function’s Tier 1 & 2 program for special education classrooms.** FRONTIER 21 examined data collected from teachers in 20 low incidence classrooms for special education students, including individual case studies about specific students. The focus of this “Special Education” component was primarily on Tier 2 intervention programs (e.g., a 10-day behavioral program that included professional development on the use of the Break Box and provision of a Break Box to all participating teachers to use with their students in classroom settings).
- **Fun and Function’s Break Box Behavioral therapy program in a whole school intervention model.** FRONTIER 21 examined the impact of professional development on Break Box use and introduction of Break Boxes to all regular education teachers and classrooms in grades K to 5 on regular and special education students’ disruptive behaviors as reported by teachers and documented by the school’s administrators. FRONTIER 21 gathered teachers’ and school administrators’ assessment of issues surrounding implementation of this type of intervention across an urban school with many academic and behavioral challenges, and their suggestions for successful use of the Break Boxes in regular education classrooms.

Data Collection

The researchers collected the following data to inform the two Break Box studies:

- Teacher reports of special education students' disruptive behaviors and challenges to Break Box implementation over the course of a two-week intervention in New York's District 75.
- "Pre" and "Post" implementation teacher surveys focusing on use of the Break Box in regular classrooms, and reflections on issues impacting the use of the Break Boxes for addressing disruptive behaviors in their classrooms. Surveys were conducted in a "schoolwide" intervention (grades K to 5 in a K to 8 elementary school) in an urban charter school in Philadelphia.
- **Interviews with school administrators** at the Philadelphia urban charter school implementing the "schoolwide" intervention in regular classrooms. Interviews addressed the administrators' assessment of the impact of the intervention, the context that influenced the introduction of the intervention, and the challenges involved in bringing such an intervention to a school with numerous challenges undergoing multi-part school-improvement efforts.
- Student disciplinary records collected by the school's administrators for students in the intervention grades, K to 5, in the "schoolwide" charter school program. Disciplinary records were collected that included the number of disciplinary incidents and severity of those disciplinary incidents, expressed both as levels of severity (Level One to Level Three) and as a "discipline score", a weighted score that gave increasing weight to higher level incidents.

Value of the research

The No Child Left Behind Act (Federal Elementary and Secondary Education Act- ESEA) ushered in a new era of focus in education that required schools and school systems to identify and implement ways to help all types of learners to achieve academic success. This new focus, particularly involving measuring academic outcomes for all subgroups of students, challenged teachers and schools to both identify individual students' needs and to find interventions that would enable students to overcome the obstacles that hold them back from achieving at their respective grade level. Federal special education law required a multi-tiered approach called RTI (Response to Intervention) that had three levels of intervention to address students' needs. Those levels could be thought of as: Level One- large group with identification and small modifications, Level Two- smaller groups, with specialized interventions based on students' needs, and Level Three- much smaller group or one-to-one intensive treatment to ameliorate specific learning challenges. Fun and Function's Break Box was designed by therapists to be used as an RTI intervention, particularly with students who exhibit disruptive behaviors due to disabilities such as AD/HD and Autism. In order for RTIs such as the Break Box to be successful, their use and impact must be examined in education settings, and information must be collected on what is required in schools and classrooms for them to achieve that impact. When used properly, especially in first years of schooling, RTIs can help students with learning challenges experience high levels of success, which is key to motivating them to pursue higher learning and ultimately to be successful beyond the boundaries of school.¹

¹ Konrad, M., Fowler, C. H., Walker, A. R., Test, D. W., & Wood, W. M. (2007). Effects of self-determination interventions on the academic skills of students with learning disabilities. *Learning Disabilities Quarterly*, 30(2), 89-113.

The Break Box RTI was designed to encourage students to self-regulate. The goal is to help students avoid disruptive behaviors by having them select specially-designed tools to self-regulate. Self-regulation strategies and skills have been shown to help lessen behavioral incidents and increase student academic achievement.² Fun and Function realizes the importance to any RTI of not only having the right tools, but also having training in how to use those tools effectively, and having an educational context that facilitates the use of those tools (e.g., a safe place to keep the tools, a school leader who supports the intervention). Their Break Box program, therefore, provides both the tools that students and teachers use and professional development for the teachers prior to their introduction in the classroom.

Potential impact, potential cost savings

All students in the U.S. are entitled to a Free and Appropriate Public Education regardless of their learning challenges, a right that is granted in the federal Individuals with Disabilities Education Act (IDEA). This is a wonderful aspect of the American education system, as it provides an opportunity for all children to learn in a government-supported environment that can be designed around their needs. For most students with special needs, this entitles them to academic support and therapies offered one to two times each week that can keep them in the regular classroom with their peers. For other students, however, particularly students with difficulty controlling their behaviors, interventions require much more attention and intervention from adults—both inside and outside of the classroom. Students with behavioral challenges, such as those with AD/HD and Autism Spectrum Disorders (ASD) can be very difficult to manage in a regular classroom setting, and may require completely separate classrooms, or even a “one-to-one” adult behavior specialist who works with only that student all day, every day. The expenses of managing a student with major behavioral problems due to disabilities such as AD/HD can be very high. The expenses have been identified as: (1) The cost of special education utilization, (2) The cost of grade retention, and (3) The cost of student discipline, in addition to the cost of that student’s participation in regular education.³ The additional cost beyond the cost of regular education for educating students with AD/HD alone were estimated to be over \$5,000 per student per year, more than 10 times the “average” special education student, and over 13 billion dollars nationally in 2010.⁴ The cost of providing discipline alone for AD/HD students was estimated by Robb and colleagues (2010) to be ten times the cost of providing discipline for regular education students. This does not include the ancillary costs to fellow students’ education when teachers must spend time away from their academic instruction in order to address disciplinary issues in their classrooms. Clearly, there is a great need to find remedies that can reduce the amount of disciplinary interventions needed for students with behavioral issues, if only to lower the costs associated with their frequent disruptions. The Break Box intervention projects were adopted by NYC public schools and a large urban school in Philadelphia as an attempt to reduce the costs and improve the academic outcomes associated with educating students with severe behavioral challenges.

2 Dembo, M.H., & Eaton, M.J. (2000). Self-regulation of academic learning in middle-level schools. *The Elementary School Journal*, 100(5), 473-490. Miech, R., Essex, M.J., & Goldsmith, H.H. (2001). Socioeconomic status and the adjustment to school: The role of self-regulation during early childhood. *Sociology of Education*, 74, 102-120.

3 Robb, J. A. , Sibley , M. H. , Pelham , W. E. , Michael Foster , E. E. , Molina , B. S. , Gnagy , E. M. , & Kuriyan , A. B. (2011). The estimated annual cost of ADHD to the US education system . *School Mental Health* , 3 , 169 – 177 .

4 Ibid.

About Fun and Function's Break Box Intervention Program

Fun and Function has been designing and creating sensory products for students with behavior-related disabilities and has been supporting the special needs community for nearly a decade. Fun and Function created the Active Mind Partnership (AMP) to address the major impediments unmet sensory needs pose for learning and the difficulty schools have in addressing those needs. AMP provides a framework to help schools create programs and infrastructure to address sensory needs, reduce behavioral challenges, and increase learning.

There are two guiding principles that are pivotal in defining the elements of the AMP program:

- **Teacher Empowerment** - the realm of sensory integration is typically relegated to the professional world of therapists. While therapists have their hands full with helping children develop fine and gross motor and other skills, the same sensory needs and characteristics create behavioral challenges that teachers confront throughout the day and that therapists can only help address when available. A central mission of the program is to empower teachers to address some of the sensory needs and thereby reduce behavioral challenges.
- **Student Self-Regulation** - the ability to self-regulate is a powerful tool for life. However, self-regulation is not just a valuable tool in the long run, it is something that Fun and Function believes is attainable for students with severe special needs and is more effective at addressing a certain type of need than externally prescribed interventions.

There are three critical components in the AMP model that all must work together to create a supportive behavioral climate: student, teacher and tools. Fun and Function has developed a set of tools and a “toolkit” to address special education students’ sensory needs in regular and special education classroom settings. Improving the behaviors of students in classrooms is particularly important as the trend toward inclusion of all students in regular classrooms becomes increasingly popular, and as the population of students with extraordinary sensory issues, such as those on the autism spectrum, is growing dramatically. Sensory intervention therapy has a long history of use with students with behavioral issues, however, there is relatively little information available on how teachers use those tools in low-incidence environments and on the long-term impact of the use of sensory tools on student behaviors.

Sensory integration is a crucial factor for enabling people to focus on any given task, but it is particularly important to the success of children with special needs. Because of the wide variety of sensory integration issues that children can have (e.g., sensitivity to touch, sensitivity to light), and because teachers vary widely in their approaches to working with students in their classrooms, it is critical for a sensory program to have a variety of physical tools as well as flexibility and multiple strategies. The Break Box has 15 tools to address prevalent needs in different ways. The Active Mind framework indicates that teachers should determine whether to use the tools as a preventative measure or as a reward, during instruction or as a structured break or throughout the day. This makes the program a tool for the teacher to apply on an ongoing basis in a dynamic manner, which is the most effective way to address sensory needs. The Break Box program that was provided to both studies reported on here included:

- **Toolkit:** The Fun and Function Break Box was provided to each of the participating teachers. The

Break Box includes 15 sensory tools that address a range of needs within the classroom (including play putty, pressure foam roller, turtle-shaped massager, noise reduction headphones, gel “fidgets”, and similar items).

- **Training:** A full day of training was provided to teachers, including a presentation about sensory integration by an Occupational Therapist as well as workshops for the teachers to develop a strategy to introduce the Break Box to their classrooms and integrate it into the daily schedule.
 - **Online Communication:** Fun and Function provided an online platform (Basecamp) which allowed teachers to post their reports as well as discuss challenges and ideas throughout the program.
 - **Reporting:** There were three reporting requirements used in the District 75 intervention:
 - Teacher Report on how the Break Box was being used in classroom management and with particular students.
 - Teacher Report on student self-regulation in the classroom
 - Teacher Report on use of Break Boxes in Tier 2 intervention programs aimed at reducing challenging behaviors with students with particularly pronounced behavioral problems over a period of two weeks (10 school days).
- › Note: In the Philadelphia Charter School intervention, teachers reported primarily through beginning and end of project online, anonymous surveys.

Overview of the Two Fun and Function Break Box Intervention Projects

Special Education Classroom Intervention

In May 2015, District 75 in New York City selected the Active Mind Partnership for its summer pilot program which was scheduled to launch on July 1, 2015. The leaders of programming in District 75 saw the program as a good fit, as sensory needs were central to the special needs community. The pilot was developed to provide a platform to test the program and prepare it for consideration to qualify as a district-wide program.

“Whole School”/Regular Education Classroom Intervention

In February 2017, DCS selected the Active Mind Partnership (Break Box) program to serve as one component in a new classroom and behavior management model that was being implemented in grades K-5 within a larger grade K-8 school. DCS had previously been designated by the School District of Philadelphia as a “Renaissance School” in need of major overhaul, due to its consistently high number of student behavior incidents. The school’s administrators believed that the Active Mind program would be a helpful method to reduce problem behaviors in K to 5th grade classrooms.

In the years prior to the introduction of the Break Box program, DCS students with high level behavior incidents were placed in a special within-school academy on the third floor of the building. At the beginning of the 2016-2017 school year, the within-school academy was dissolved and students that attended it were

integrated into the mainstream classrooms. This change in the school structure resulted in some difficulties in implementing the Fun and Function “Break Box.” The school principal noted that teachers were overwhelmed with the influx into their classrooms of students that had previously attended the separate within-school academy. Subsequently, the principal had trouble “getting teachers to buy into therapeutic interventions being ‘the answer.’” The principal also stated that she probably introduced the program “too early in the evolution” of DCS, as it gradually transitioned into a safe, calm school. In other words, the timing of the intervention was not ideal to enable teachers to focus fully on ensuring its implementation. However, these types of major changes and shifts in program and leadership are not uncommon among urban public schools, so it provides an opportunity to see the intervention in the environment of “constant change” that typifies many urban schools.

Findings from the Special Education Classroom Intervention Study

In this study, teachers and administrators set behavioral improvement goals for each student that they hoped to achieve for each student through the use of Fun and Function Break Boxes in their classrooms. Their targets for individual students ranged from a 10% reduction in behavioral incidents requiring the teacher’s attention to an 85% reduction. The average targeted reduction in disruptive behaviors for the classroom interventions was 41%. The researchers found that District 75 teachers and administrators exceeded that goal by 18%, showing an overall improvement in behaviors of 59% (see Table 1.1 below). Of the 20 students for whom daily student data were tracked, the average number of incidents declined from 11 to 4 over the 10 days of the intervention. The reduction in problem behaviors ranged from 25% to 83%. Fourteen (70%) exceeded their behavior targets, three (15%) met their targets exactly, and three (15%) did not achieve their initial target by the end of the intervention. All of the participating students (100%) reduced the number of behavioral incidents from the baseline to the last day of the treatment (0th day to 10th day). Figure 2.1 shows that 70% (14 of 20) of the students with teacher reports reduced their behavioral problems to the target level within 10 days of implementation. Figure 2.2 shows that behavioral incidents per day were reduced from 11 to 4 by the end of the study period.

Table 1.1. Summer and Winter Behavioral Incidents, Special Ed Intervention

Group (Intervention)	Student	Diagnosis	Target Behavioral Improvement	Achieved Behavioral Improvement	Target vs Achieved Behavioral Improvement	Target Met	Baseline Incidents Before Breakbox	Number Incidents After Breakbox
ALL	ALL	ALL	41%	59%	+18%	Exceeded	11	4
Summer 2015	A	Autism	50%	43%	-7%	Below	7	4
Summer 2015	B	Autism	50%	29%	-21%	Below	7	5
Summer 2015	C	Autism	50%	83%	+33%	Exceeded	6	1
Summer 2015	D	Autism	25%	42%	+17%	Exceeded	12	7
Summer 2015	E	Autism	50%	50%	0%	Met	2	1
Summer 2015	F	Autism	80%	85%	+5%	Exceeded	20	3
Summer 2015	G	Autism	10%	47%	+37%	Exceeded	15	8
Summer 2015	H	Autism	50%	80%	+30%	Exceeded	10	2
Summer 2015	I	Autism	25%	77%	+52%	Exceeded	13	3
Summer 2015	J	Autism	25%	83%	+58%	Exceeded	12	2

12/7/2015	K	Int Dis	75%	67%	-8%	Below	12	4
12/7/2015	L	Autism	75%	75%	0%	Met	20	5
12/22/2015	M	Autism	25%	25%	0%	Met	8	6
12/22/2015	N	Autism	25%	70%	+45%	Exceeded	10	3
12/22/2015	O	Autism	25%	40%	+15%	Exceeded	10	6
12/22/2015	P	Autism	25%	52%	+27%	Exceeded	23	11
12/22/2015	Q	Autism	25%	63%	+38%	Exceeded	8	3
12/22/2015	R	Autism	85%	77%	-8%	Below	22	5
12/22/2015	S	Autism	25%	56%	+31%	Exceeded	9	4
12/22/2015	T	Autism	25%	38%	+13%	Exceeded	8	5

Table 1.1A Individual Student Behavioral Incidents in Classroom interventions, by Day, Summer and Winter Special Ed Interventions

Group	Student	Diagnosis	Day [Incidents by Day of Intervention]									
			1	2	3	4	5	6	7	8	9	10
ALL	ALL	ALL	11	10	9	8	8	6	6	6	5	4
Summer 2015	A	Autism	6	5	5	5	5	6	4	4	3	4
Summer 2015	B	Autism	6	5	5	6	5	5	5	5	5	5
Summer 2015	C	Autism	5	4	4	3	2	2	3	3	1	1
Summer 2015	D	Autism	12	13	10	10	8	8	7	8	7	7
Summer 2015	E	Autism	2	2	2	1	2	1	1	2	1	1
Summer 2015	F	Autism	18	15	13	12	13	10	7	5	3	3
Summer 2015	G	Autism	15	12	8	10	11	6	10	7	8	8
Summer 2015	H	Autism	1	2	4	2	1	2	2	3	2	2
Summer 2015	I	Autism	13	10	11	9	4	1	8	3	2	3
Summer 2015	J	Autism	12	15	7	3	10	5	3	6	1	2
12/7/2015	K	Int Dis	12	11	11	10	8	8	7	6	5	4
12/7/2015	L	Autism	20	17	15	10	7	8	6	8	4	5
12/22/2015	M	Autism	8	7	9	8	6	7	6	5	5	6
12/22/2015	N	Autism	6	5	6	4	5	4	3	4	4	3
12/22/2015	O	Autism	10	12	11	11	9	8	9	7	8	6
12/22/2015	P	Autism	23	24	22	25	20	16	17	15	13	11
12/22/2015	Q	Autism	8	10	9	9	7	5	5	3	2	3
12/22/2015	R	Autism	22	15	17	11	7	9	4	9	10	5
12/22/2015	S	Autism	9	12	6	7	15	5	5	2	4	4
12/22/2015	T	Autism	8	8	5	5	6	8	4	6	3	5

Figure 2.1 Reduction in Problem Behavior Within 10 Days of Implementation, by Student, Special Ed Intervention

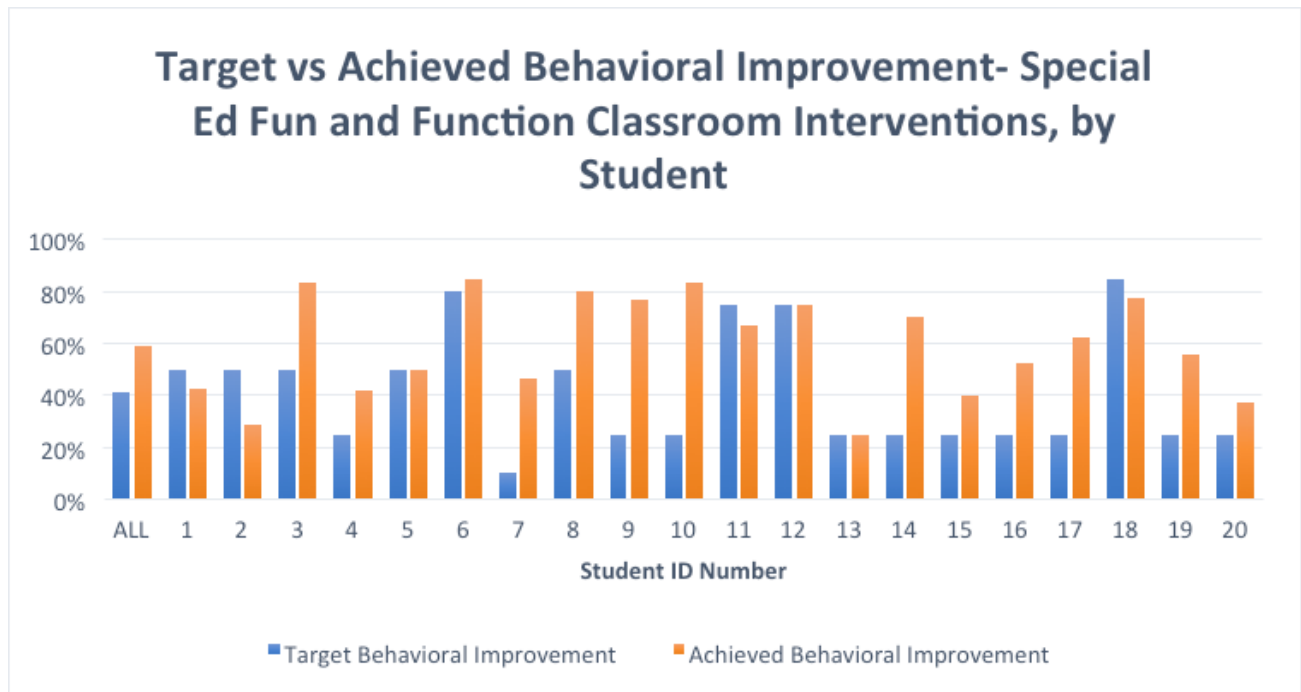
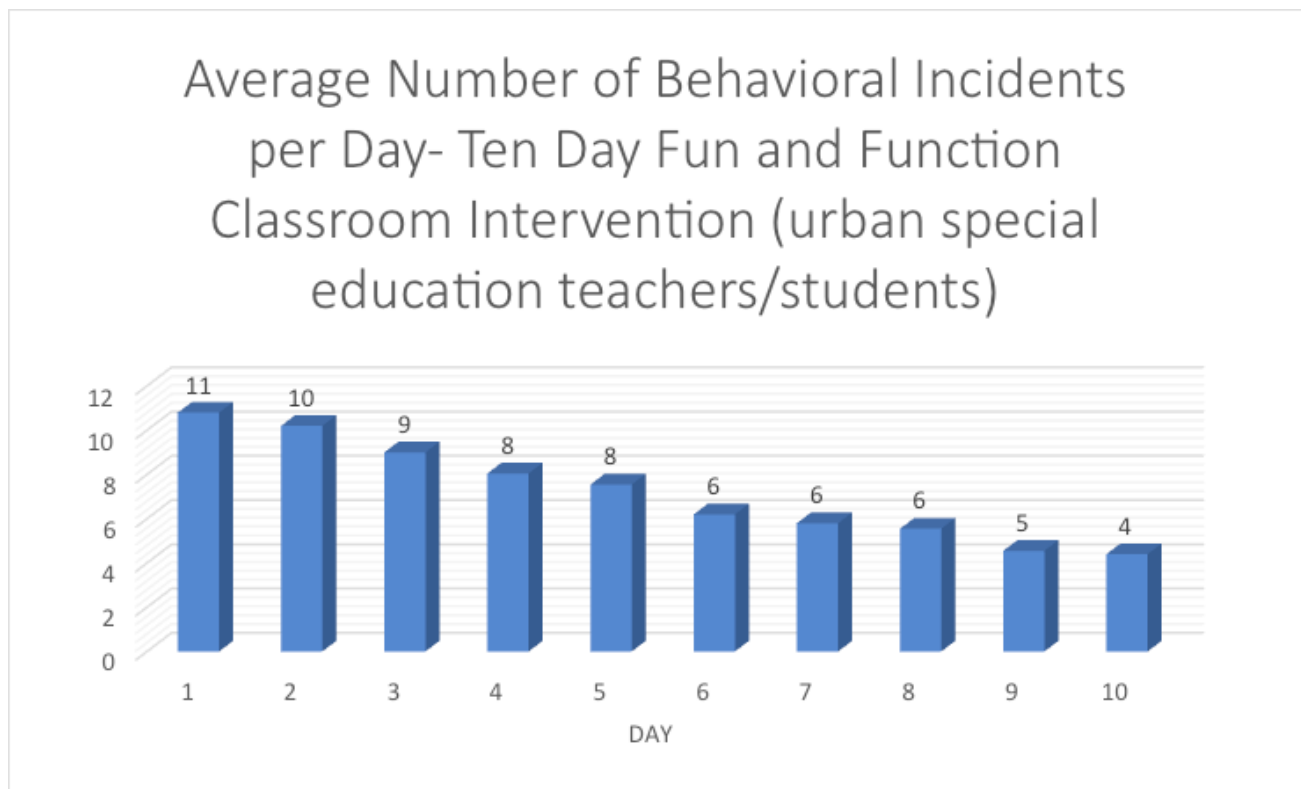


Figure 2.2: Reduction in Daily Behavioral Instances, Special Ed Intervention



One of the tasks given to participating teachers was to create an individualized sensory program for one special education student that utilized the Break Box to address a challenging behavior. The initial targeted improvement level was 36%, however the results after the Breakbox intervention were 65%, close to double the average targeted behavioral improvement (see Table 1.2). Figure 1.1 shows that 74% (14 of 19) of the students with teacher reports reduced their behavioral problems to the target level within 10 days of implementation. Figure 1.2 shows that behavioral incidents per day were reduced from 11 to 6 by the end of the study period.

Table 1.2. Individualized Sensory Program Results, Special Ed Intervention

Teachers who Implemented an Individual Program	Teacher Reported Success	Target Behavioral Improvement Average	Achieved Behavioral Improvement Average
10 of 20 teachers	90%	36%	65%

Overall, teachers were very positive about the Break Box interventions in the Special Education Classroom Project. In District 75, 94% of participating teachers stated that they found the program meaningful and that they were able to leverage the tools provided in the Break Box to improve student behaviors.

Teacher Strategies in Special Education Classrooms

In one part of the District 75 Break Box intervention, teachers recorded and analyzed behavioral changes of three students over a period of 10 days. One of the students who demonstrated success was an 18-year-old boy who had been diagnosed with intellectual disability. His challenging behavior was impulsivity and uncontrolled movement. To help him manage his hyperactivity and noise sensitivity, the teacher introduced the Break Box to him, including noise reduction earmuffs and weighted compression vest. According to the teacher’s observation, the Break Box started to show obvious impact from Day 3, and the number of the students’ measured behavioral issues per day consistently decreased from 12 on the first day to just 4 by the 10th day.

A second student in the intervention was a 15-year-old boy who had been diagnosed with ASD, which produced hypersensitivity. During a “sell & buy” session, teachers used a turtle from the Break Box (a turtle-shaped massager) to keep the student seated and calm until the activity was complete. Weighted vest and noise reduction headphones were used as well. The number of that students’ behavioral issues per day consistently decreased from 20 to 7 for the first five days and then fluctuated between 4 and 8 for the next five days.

Another teacher reported a third student’s classroom behavior. When the student refused/avoided to complete his classwork, the teacher utilized the Break Box items “squishy gel cushion” and “weighted lap pads”. That students’ problematic behaviors gradually improved over the first 10-day period, although the progress was not consistent. In the second 10-day intervention period, the student had only 10 or fewer incidents (which was lower in general than in the first 10 days), and became relatively stable from day to day.

Findings from the Schoolwide Classroom Intervention

The “Schoolwide” study examined the implementation and possible impact of introducing Fun and Function Break Boxes in regular classrooms in an urban public school. DCS serves a very low-income population of urban students from an economically disadvantaged neighborhood in Philadelphia. Many of those students have special education needs associated with behavioral disruptions (e.g. AD/HD, Autism). Hoping to reduce behavioral issues among both regular and special education students, administrators at DCS formed a partnership with Fun and Function to bring Break Boxes to all Kindergarten through fifth grade classrooms and to provide training for teachers on how to successfully implement the Break Boxes to reduce disruptive behaviors in their classrooms.

This study reviewed the extent to which teachers utilized the Break Boxes, inquired into teacher opinions on the effectiveness of Break Boxes, and identified strategies associated with successful Break Box implementation. Additionally, the study aimed to explore the extent to which students with Break Boxes in their classrooms improved on multiple behavioral measures. Teacher surveys were conducted at the beginning of the intervention and again at the end of the year to explore the implementation of the program. To measure behavioral outcomes, DCS shared school-level discipline data with Fun and Function collected before and after implementation. Specifically, DCS tracked the number of behavioral incidents per student as well as an overall discipline score for each student over two periods of 45 days, first at the beginning of implementation and again after several months of implementation.

Teacher Reflections on Break Box Implementation

In the following sections, factors related to the overall success of the program, such as fidelity in implementation and how and with whom the Break Boxes were used, are discussed. These findings are based solely on teacher responses to the survey administered during implementation and the survey administered at the end of the year.

Teacher Qualifications and Survey Response. Table 2.1 provides response rates on both the implementation and year-end surveys used in the DCS study. The table shows that far more teachers responded to the initial survey than to the year-end survey. Table 2.2 shows the certification area and Table 2.3 shows the grade levels taught by teacher respondents.

Table 2.1. Teacher Survey Response Rate, Schoolwide Intervention

	Total # of Respondents
Initial survey	20
Year End Survey	6

Table 2.2. Teacher Survey- Certification Type, Schoolwide Intervention

Certification Type	Initial survey	Year End Survey
Special Education Certification	20%	50%
Regular Education Certification	65%	50%
Specialty Certification (e.g., Art, Music, Physical Education)	15%	0%

Table 2.3. Teacher Survey- Grade Level Taught, Schoolwide Intervention

Grade Level Taught	Initial survey	Year End Survey
Kindergarten	30%	17%
1st	25%	17%
2nd	25%	0%
3rd	15%	33%
4th	30%	67%
5th	20%	33%

Implementation of Break Boxes and Use by Teachers, Schoolwide Intervention

At the outset of the program, the majority of teachers used the Fun and Function Break Box as a Tier 2 intervention with students who had specific behavior-related needs, rather than as a Tier 1 intervention for all students. However, at the end of the year, more teachers used the Break Box as a Tier 1 intervention for all students in the classroom than as a Tier 2 “targeted” intervention. Table 2.4 shows the differences in responses between the initial survey and the end of the year survey regarding teachers’ use of the Break Box with special populations. Table 2.5 shows that teachers adjusted their strategies from the initial implementation period to the end of the year in their use of Break Boxes as a Tier 1, “whole classroom” strategy. A smaller percentage reported using the Break Box with almost all students at the end compared to the beginning (e.g., 0% with 76% to 100% of students), and a larger percentage reported using the Break Box with relatively few students (e.g., 50% with 1% to 25% of students).

Table 2.4. Teacher Uses of Break Box by Student Population, Tier 1 or Tier 2 Use, Schoolwide Intervention

Use with Student Types	Initial survey	Year End Survey	Difference
Yes-With Certain Students (Tier 2)	75%	25%	-50%
Yes-With All Students (Tier 1)	20%	75%	+55%
No-Did Not Use It with Any Students	5%	0%	-5%

Table 2.5. Teachers' Use of Break Box Items with Given Percentages of Students, Schoolwide Intervention

Percentage of Students	Percentage of Teachers Responding		
	Initial survey	Year End Survey	Difference
0% of Students	15%	17%	+2%
1%-25% of Students	35%	50%	+15%
26%-50% of Students	15%	17%	+2%
51%-75% of Students	20%	17%	-3%
76%-100% of Students	15%	0%	-15%

On the year-end survey, fewer teachers reported not using the Break Box items at all during a given day than they did when the program began. The percentage of teachers who used them one to two times during the day was more than double the percentage using them one to two times per day at the beginning. However, the number of teachers who reported using items three to six times and seven to ten times per day declined from the beginning of implementation to the end of the year. Table 2.6 shows the differences in responses between the initial survey and the year-end survey.

Table 2.6. Teacher Use of Break Box Items Per Day, Schoolwide Intervention

Number of Times Use Items Per Day	Initial survey	Year End Survey	Difference
0 Times	25%	17%	-8%
1-2 Times	30%	67%	+37%

3-6 Times	40%	17%	-23%
7-10 Times	5%	0%	-5%
11+ Times	0%	0%	0%

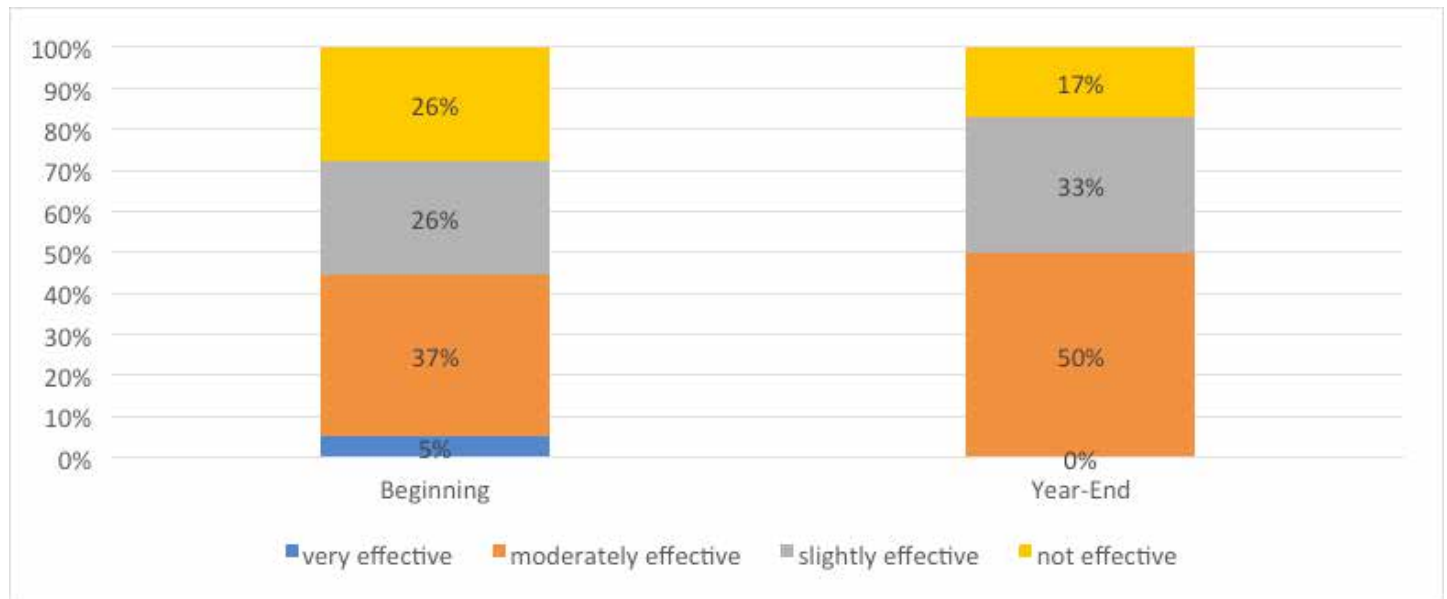
The percentage of teachers who reported using Break Box items five to nine times per week more than doubled from initial implementation to the end of the year (20% to 50%). The percentage reporting using the Break Box ten times or more per week dropped by 30% from the beginning of the project to the end of the year. Note that this could be due to the differences in the number of teachers who responded to the survey at the beginning of the project and at the end. Table 2.7 shows the differences in reports on use per week from the initial survey to the year-end survey.

Table 2.7. Teacher Use of Break Box Items Per Week, Schoolwide Intervention

Number of Times Use Items per Week		Initial survey	Year End Survey	Difference
0 Times	15%		17%	+2%
1-4 Times	35%		33%	-2%
5-9 Times	20%		50%	+30%
10-15	20%		0%	-20%
16+ Times	10%		0%	-10%

Two-thirds of teachers surveyed (67%) of teachers reported on the year-end survey that, overall, use of the Break Box positively improved their classroom environment. This was an increase of 12% from teacher reports on the initial survey. Additionally, 83% of teachers surveyed reported that using the Break Box had a positive impact on their students' behaviors. Teacher survey responses also showed stronger positive attitudes regarding the effectiveness of the Break Box at the end of the school year. When surveyed during the implementation phase, only 68% of teachers found the program to be effective. On the year-end survey, 88% of teachers found the program to be effective—an increase of 20%. The percentage of teachers reporting that the program had no impact on student behaviors decreased by 3% from the initial implementation survey to the year-end survey. Figure 2.3 below provides a breakdown of teacher perceptions regarding the effectiveness of the program.

Figure 2.3. Teacher Assessment of Effectiveness of Break Boxes in Improving Student Behavior, Schoolwide Intervention



Challenges in Break Box Implementation

As teachers used the Break Boxes more during the school year, they became more familiar with them and began adjusting their approaches to using them. At the beginning of implementation, some teachers did not believe they knew how to properly use some items. By the end of the year, no teachers reported that they did not know how to properly use items. At the end of the year, more teachers reported that they were managing the use of the Break Box without disrupting classroom learning. Teachers also reported that there were not enough of certain items to use for their classroom. Specifically, teachers believed that having included more fidget items would have been useful. Table 2.8 shows the differences in reports on struggles encountered by teachers when using the Break Box from initial survey to year-end survey.

In the open response section, 25% of teachers taking the initial survey indicated that students stealing, misusing, or vandalizing Break Box items made it difficult to use. Other teachers stated that, since some students began to view the items as toys, students began to act out to be allowed to use it. Conversely, other teachers reported on the end of the year survey that use of Break Box items helped students calm down and refrain from outbursts that usually ended with those students destroying classroom supplies and property. Clearly, teachers had different experiences when attempting to use the Break Box in their classrooms (See Table 2.8 below). No teachers reported having zero challenges when working with the Break Box.

Table 2.8. Teacher Reported Challenges When Using Break Box, Schoolwide Intervention

	Initial survey	Year-end Survey	Difference
Not Enough Variety in Break Box Items	0%	17%	+17%
Not Enough of Certain Items	15%	33%	+18%
Nothing Seems Particularly Useful for My Students	20%	0%	-20%
Managing Use of Break Box Without Disrupting Learning	20%	50%	+30%

How to Properly Use Each Item	15%	0%	-15%
Choosing Proper Item for Child to Use	5%	0%	-5%
I Am Not Experiencing Any Challenges	0%	0%	0%

Student Behavioral Outcomes, Schoolwide Intervention

During the year of the study (2016-17 school year), DCS collected multiple metrics related to student behavior, including the frequency of disciplinary incidents and an overall discipline score for each student. DCS's Code of Conduct categorizes disciplinary incidents by level of severity as outlined in Table 2.9. These codes were documented with each reported student disciplinary incident (e.g., a student might have three Level 1 incidents and two Level 2 incidents in their file). The majority of students had no disciplinary incidents reported during the time of this study (45 days prior to the start of the intervention in February and 45 days at the end of the school year).

Table 2.9. DCS Code of Conduct Disciplinary Incident Levels, Schoolwide Intervention

Level	Severity	Example Offenses
Level 1	Mild	Class disruption, lateness, uniform violations, inappropriate language, gum chewing or eating/drinking in class, littering on school property, use of personal electronics (e.g. cell phones, iPods) in the classroom
Level 2	Serious	Repeated class disruption, physical aggression, provocation or inciting violence, harassment, insubordination, cheating, damaging or stealing property
Level 3	Severe	Fighting, threatening staff, bullying or cyberbullying, vandalism, sexual harassment, weapon or firearm possession, drug, alcohol, or tobacco possession, weapon or firearm possession, terroristic threats

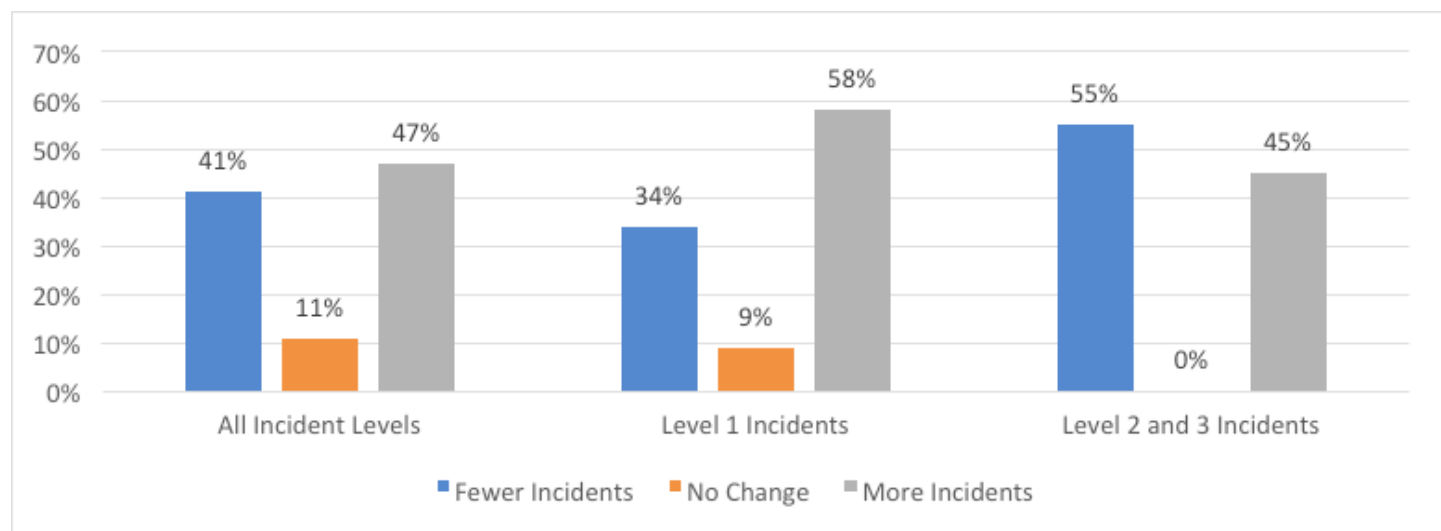
To create an overall measure of student behavior, DCS also computes a weighted discipline score totaling all incidents per student, where Level 2 and 3 offenses carry more weight than Level 1 offenses. Both behavioral measures collected by DCS—incident frequency and weighted discipline score—were used for the present analysis. Incident frequency explains how many offenses of all types students commit, while discipline scores provide more information about the severity of those incidents.

Incident Frequency Findings. Overall, there was wide variability in behavior among students with Break Boxes in their classrooms, with some students showing improvements, some showing no change, and others showing declines. These trends are not surprising, as teacher implementation of Break Boxes varied between classrooms, and as students demonstrated a diverse range of behavioral challenges. Paired sample t-tests were used to detect mean level differences on student behavior measures from the first to the second data collection period. There were no statistically significant improvements in overall student behavior by any measure. However, comparing the difference of mean scores for all students pre- and post-intervention masks sizable proportions of students who *did* demonstrate better behavior with Break Boxes in their classrooms.

During the study period (winter and spring of school year 2016-17), DCS served 512 students in grades K to 5. Of those, 193 (38%) had a record of behavioral incidents in the 45-day period before the teachers received their Break Boxes. Of that group of students with reported disciplinary incidents, 41% committed fewer total incidents after Break Boxes were introduced to their classrooms, while 11% demonstrated no change and 47% had more incidents. This includes the types of behavioral infractions targeted by the intervention, such as classroom disruption, but it also includes incidents like uniform violations and lateness that would not likely be impacted by Break Boxes. It is possible that students who improved were also those who initially demonstrated behaviors associated with sensory and executive functioning needs, while students who stayed the same or declined may have exhibited other types of behaviors. However, as DCS did not provide details about the specific incidents committed by students, this level of analysis is beyond the scope of the present study.

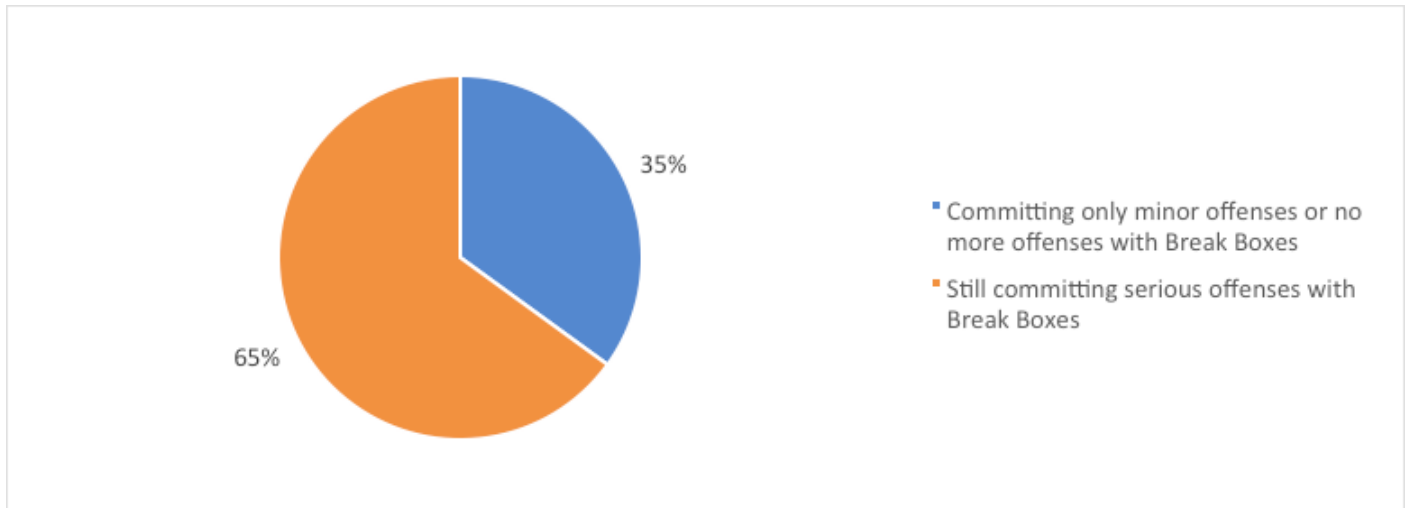
With Break Boxes in all classrooms, serious behavior incidents improved more than minor infractions. Of students with a record of Level 2 and 3 incidents (n=134), 55% committed fewer Level 2 and 3 infractions after receiving the intervention, while 45% displayed more of these severe behaviors. In contrast, of students with a record of Level 1 incidents (n=158), 34% committed fewer Level 1 behaviors, 9% demonstrated no change, and 58% displayed more Level 1 behaviors. Note that these groups are not mutually exclusive; many students had records of both Level 1 and Level 2 incidents. Figure 2.42 illustrates changes in incident frequency before and after the Break Box introduction, by level of incident severity. Of students committing Level 2 and 3 infractions prior to receiving break boxes (n=110), 35% were no longer demonstrating any serious behavior problems after several months of the intervention, committing only Level 1 offenses or no offenses at all. Figure 2.5 displays changes in incident severity of students initially committing serious (Level 2 and 3) offenses.

Figure 2.4. Changes in Behavior Incident Frequency with Break Boxes in the Classroom by Incident Severity, Schoolwide Intervention



Note – Although Break Boxes were implemented at DCS as a Tier 1 Intervention for all students, over 60% of the total K-5 population had no behavioral incidents during the evaluation period and were thus excluded from analysis.

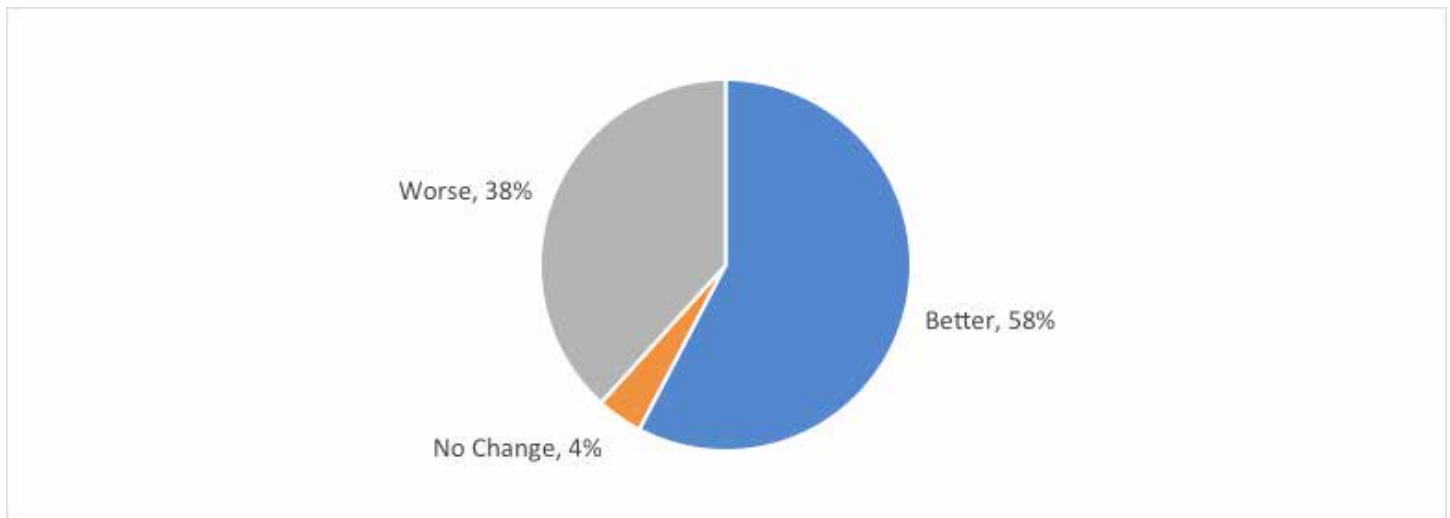
Figure 2.5. Improvements in Incident Severity of Students Initially Committing Serious Offenses, Schoolwide Intervention.



Discipline Score Findings. Students at DCS receive a discipline score each marking period, formulated such that more serious incidents (Level 2 and 3) carry more weight than minor incidents (Level 1). This weighted discipline score serves as a useful measure of each student’s overall behavior, accounting for both the frequency of disciplinary incidents as well as the severity of each incident. Discipline scores for the 45-day period before implementation of Break Boxes and the 45-day period several months into the intervention were compared.

As with disciplinary incident frequency, student discipline score outcomes varied widely, with some students demonstrating improvements and others demonstrating declines. Once again, it is important to note that the discipline score captures behaviors related to sensory and executive functioning needs as well as other types of prohibited behaviors that would not reasonably be impacted by Break Boxes (e.g. uniform violations, lateness, gum chewing, etc.). Using paired sample t-tests, no statistically significant differences in mean student discipline scores before and after the Break Box intervention were found. However, many individual students *did* demonstrate improvement. Of students with an initial discipline score indicating a need for improvement (n=175), 58% earned a better discipline score in the marking period after Break Box implementation, while 4% earned the same score and 38% earned a worse score. Figure 2.6 displays these changes. It is possible that students who demonstrated improvements were also the students with the types of behaviors targeted by the Break Box intervention (e.g. classroom disruption), while students who declined demonstrated behaviors not likely to be impacted (e.g. uniform violations). However, this type of analysis was beyond the scope of the present study. Further investigation is needed of the specific types of behavioral challenges displayed by students who improved versus students who declined.

Figure 2.6. Improvement in Student Discipline Score Before and After Break Box, Schoolwide Intervention



Note – Students who committed no disciplinary incidents during either marking period received discipline scores of zero and were thus excluded from the analysis.

Special Education Students. Break Boxes were implemented in all K-5 classrooms at DCS for use by any students who may benefit. The Break Box tools were made available to both regular and special education students, who learned together in integrated classrooms. However, the Break Box intervention was designed by Fun and Function primarily for students with special learning needs, such as ADHD, autism, anxiety, auditory sensitivity, or other challenges that may impede classroom academic engagement. Many students with these needs qualify for special education services. Therefore, it is reasonable to believe that as a group, special education students may reap greater benefits from Break Boxes than regular education students, many of whom may have rarely needed or used the Break Box tools.

Students were determined to be in need of improvement and subsequently included in the present analysis if they committed at least one incident during the initial data collection period. Overall, special education students at DCS were more likely to have Level 1 disciplinary incidents prior to Break Box implementation compared to regular education students. During the first period of data collection, 51% of special education students had at least one Level 1 incident compared to only 38% of regular education students. This difference in proportion of students needing to improve from each group was smaller for Level 2 and 3 incidents, and relatedly, discipline scores. Specifically, 38% of special education students had at least one Level 2 or 3 incident during the first data collection period compared to 34% of regular education students, and 51% of special education students had a discipline score deemed in need of improvement, compared to 44% of regular education students.

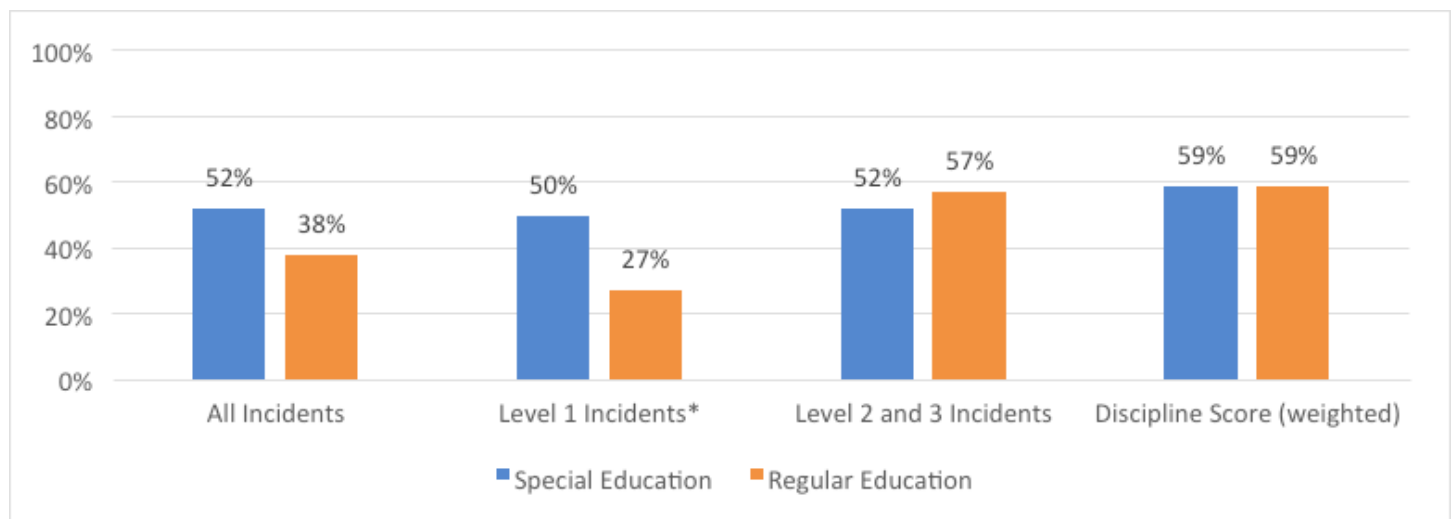
Chi-square tests were used to detect differences between special and regular education students' likelihood of showing behavioral improvements with Break Boxes implemented in their classrooms. Chi-square tests are designed to estimate associations between categorical variables. To create categorical variables for analysis, students who needed to improve their behavior during the first data collection period were sorted into three outcome categories: "improved" if incident frequency or discipline score decreased, "no change" if incident frequency or discipline score stayed the same, or "declined" if incident frequency or discipline score increased in the second data collection period. Special education status and discipline outcome were

then compared to test for association between these variables.

Chi-square tests indicated that special education students were significantly more likely than regular education students to have improved their frequency of Level 1 incidents with Break Boxes in the classroom, with 50% of special education students and 27% of regular education students committing fewer minor incidents in the second data collection period. There were no significant differences between special and regular education students' likelihood of demonstrating improvements in overall incident frequency, serious incident frequency (Level 2 and 3), or discipline score. Figure 2.7 displays the percentage of special and regular education students with initial disciplinary records who showed improvements with Break Boxes in their classrooms.

These results suggest that Break Boxes may be particularly effective in helping students with special learning needs succeed in the classroom. As Break Boxes were designed primarily for use by students with sensory and executive functioning needs, this preliminary evidence seems to indicate that the intervention is reaching its target population. However, further research is needed to establish these associations. Specifically, future studies examining students with the types of learning needs targeted by Fun and Function (e.g. AD/HD, Autism) and measuring the types of behaviors exhibited by students (e.g. disruptive or inattentive behaviors versus unrelated infractions like uniform violations) will help to more conclusively establish the impact of Break Boxes on special populations.

Figure 2.7. Percentages of Special and Regular Education Students Demonstrating Behavioral Improvements with the Break Box, Schoolwide Intervention



* Indicates a statistically significant difference between expected and observed proportions.

Note – special education status was not available for all K-5 students at DCS, resulting in a sample of n=375 for this analysis. Students were excluded from analysis if they had no incidents or a discipline score of zero during both collection periods.

Conclusions and Recommendations

FRONTIER 21 Education Solutions conducted an independent evaluation examining the success of Fun and Function Break Box implementation and its impact on student behavior in special education classrooms and as a schoolwide intervention in regular classrooms in two urban public school settings. The goals of the present study were twofold: 1) to assess the extent to which teachers found aspects of the Break Box intervention useful and aspects they felt needed improvement, and 2) to measure possible impacts on the types of disruptive student behaviors that often interfere with teaching and learning. This type of research has value in both informing Fun and Function about the relative strengths and weaknesses of its product as a behavioral intervention in classrooms and schools, and to inform schools regarding the conditions necessary to use products like the Break Box successfully.

The current evaluation study found evidence of potential benefits of using Fun and Function Break Boxes both in special education classrooms and in regular classrooms as a schoolwide intervention. Specifically, our findings revealed that special education students receiving an intensive 10-day Break Box intervention in District 75 of New York City Public Schools demonstrated an immediate overall reduction in behavioral incidents. Additionally, when implemented in regular classrooms in an urban school in Philadelphia, the majority of students exhibited fewer serious behavioral incidents and improved discipline scores after several months of implementation. Teachers in both settings considered the Break Box intervention to be at somewhat to very effective for reducing behavior issues of students with behavior problems in their classrooms. Although our findings are preliminary, given some challenges in the structure of the studies and in the form of the available information, it appears that Break Boxes may offer more benefits to special education students than regular education students, both in Special Education classrooms, and when used with students with significant behavioral problems in regular education classrooms.

Regarding challenges to implementation of the Break Boxes, teachers at DCS in Philadelphia identified several issues that they faced. The challenge most commonly cited by teachers was difficulty managing the use of Break Boxes without disrupting learning. This suggests a need for more teacher training and support regarding strategies for setting and enforcing clear procedures around Break Box use as well as a need for more guidelines regarding how Break Boxes can be used most effectively in classrooms.

As was noted earlier, this study should be viewed as a “first look” at the use of Break Box sensory tool interventions for students with behavioral interventions in regular and Special Education classrooms. The amount of available information was limited in both studies, and the interventions were introduced in complex environments where multiple types of activities were being used that affected student classroom behaviors. Therefore, it is difficult to isolate the impact of the Break Box itself within both types of classrooms. However, this study gives us some valuable information on a potentially very valuable, and cost-effective, type of intervention. With the insight collected in this study, it is possible to envision a refined study, or set of studies, that could greatly improve the use of sensory “toolboxes” in different types of educational environments. In order to gather more refined information that can guide Break Box interventions, additional research studies should begin by identifying a sample of students with the specific types of sensory needs and disruptive behaviors targeted by Fun and Function’s program. This sample could include both special education and regular education students. The two samples studied in the current evaluation—special education students in District 75 and all K-5 students at DCS—included students with other special education

or behavioral needs not addressed by Break Boxes, as well as students with no behavioral needs at all. Although one can easily envision how reducing behavioral outbreaks of students with AD/HD and Autism in classrooms could have great benefits not only for those students, but also for their peers who do not have those special needs, it will be most helpful to understand how the intervention impacts the behavior of those students in particular.

Additionally, future research should focus on the impact of the interventions on classroom disruptions, defiant behaviors, and other incidents likely to result from sensory or executive functioning needs. Data should include both the frequency of specific incidents pre- and post-intervention, and teacher reports that assess changes in student patterns of behavior in general when the intervention is introduced. The current study measured all types of behavioral incidents at DCS, including offenses not targeted by the Break Box intervention, such as uniform violations, lateness, gum chewing, and similar types of behavioral infractions. Examining classroom disruptions particularly will help Fun and Function to better understand the impact of its Break Box intervention on the specific behavioral needs targeted by the program.

Finally, follow-up studies on the implementation and impact of Fun and Function Break Boxes would benefit from a mixed-methods design that complements quantitative outcomes data with extensive classroom observations and surveys of teachers, administrators, and students. This type of qualitative data provides the contextual analysis necessary to better understand differences in implementation of Break Boxes between classrooms and schools as well as strategies used by teachers that may affect the intervention's success.

The study found evidence that the Break Box sensory toolboxes hold promise for improving the learning conditions of students in some very challenging classroom settings. This research should be viewed as a valuable “first step” in developing a deep understanding of how schools and classrooms can make the best use of these types of behavioral interventions. Additional research could benefit both Fun and Function and the schools, teachers and students who struggle with managing disruptive behaviors in their classrooms.