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## **Executive Functions: The Key to Growth in Elementary School Students**

Kelly Martin  
*Assumption College*

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# **Executive Functions: The Key to Growth in Elementary School Students**

Kelly Martin

Faculty Supervisor: Professor D'Souza

Education Department

A Thesis Submitted to FulFill the Requirements of the Honors  
Program at Assumption College

Fall 2019

**“Your classroom should feel like magic”— assistant principal  
and kindergarten teacher, Ms. B**

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## **Practicing Teachers' Definitions of Executive Functions:**

*\*These teachers' experiences will be referred to throughout the thesis*

“Cognitive process that surrounds an individual’s ability to organize thoughts and activities, plan tasks, manage time, make decisions and self-regulate”— 2nd-grade teacher, Ms. R

“Executive functioning is the ability to make decisions, regulate emotions, stay organized and carry out plans”— 1st-grade teacher, Ms. G.

“Executive function is your ability to manage tasks, make good decisions, self-start, multitask, find solutions so you can move forward”— assistant principal and kindergarten teacher, Ms. B.

“Executive functions are the skills which allow one to prioritize, organize, and carry out tasks” — 1st through 3rd-grade special education teacher, Ms. J

“Executive functions would be self-regulation or mental control needed to achieve a goal. For example, how can you control your body and mind, as well as regulate your actions to achieve your goal”— 3rd-grade teacher, Ms. E

“Executive functioning is the ability to use directions to organize and complete tasks. For instance, students must be able to listen to directions and identify the necessary tools for a task to be

completed independently. Executive functioning in my mind requires having a lot of skills in being able to take care of oneself to complete a task”— 1st-grade teacher, Ms. O

## Introduction:

“Five more minutes until you hand in your graphic organizers,” my teacher calls.

Five more minutes? Oh no! Where is it? Maybe in the desk — nope. My backpack? Nope. Oh, hey look a pencil! Did she just say that it is snowing outside? Wonder if I should play out — Wait what did the teacher say? Okay, looking for the graphic organizer. . . the graphic organizer. Michael’s mechanical pencil sounds so loud and squeaky. I hate that squeaky sound, which is why I never buy mechanical pencils.

“Two more minutes until you hand in your graphic organizers.”

Two more minutes? Alright, did I check this folder — yes! It’s in here! Finally! Oh, but wait, I only have one box out of ten filled out. . . and only two minutes to go. . . How is Sarah already on the last box — so is Jim! Okay, let’s start. . . and we’re starting. What is a fact I can put down about being a good citizen? Why are we called citizens anyway? Citizen is a funny word. Wonder what would happen if I kicked Kristin’s chair. . .

“Sorry, Kristin! Didn’t mean to do that!”

Whoops! Note to self: Don’t kick Kristin’s chair again. . . she did not seem too happy about that. Okay, a good citizen. . . a good citizen. . . How did the teacher even say to set this up at the beginning of class?

“Molly!” my teacher called, “You only have one thing written down and we’ve been working on this for forty-five minutes!”

“Because I couldn’t find the graphic organizer this entire time!” I snapped back on the verge of tears.

My teacher just does not get it. . .

The above student struggles with:

- organization (she failed to remember where she placed her graphic organizers),
- sustained attention (she did not focus on the task at hand and kept getting side-tracked by other conversations),
- task initiation (she had trouble starting her work once she found her paper),
- planning/prioritizing, as well as time management (she did not properly use the class time that she was given to complete the assignment),
- working memory (she had trouble remembering the directions that the teacher had given at the beginning of class),
- and self-regulation (she could not control her emotions when she was confronted by the teacher).

Overall, she struggled with her executive function skills. As one can see from the student’s failure to complete the assignment, executive function skills play a critical role in a student’s academic success. This correlation between executive functions and academic success has compelled me to research strategies on how we can accommodate and support elementary school students who have executive function challenges so that can be more academically successful. As a

future elementary school teacher, I believe supporting and fostering executive function skills is important because I want all students to reach their academic potential and to have the best educational experience possible.

## Overview of Executive Functions:

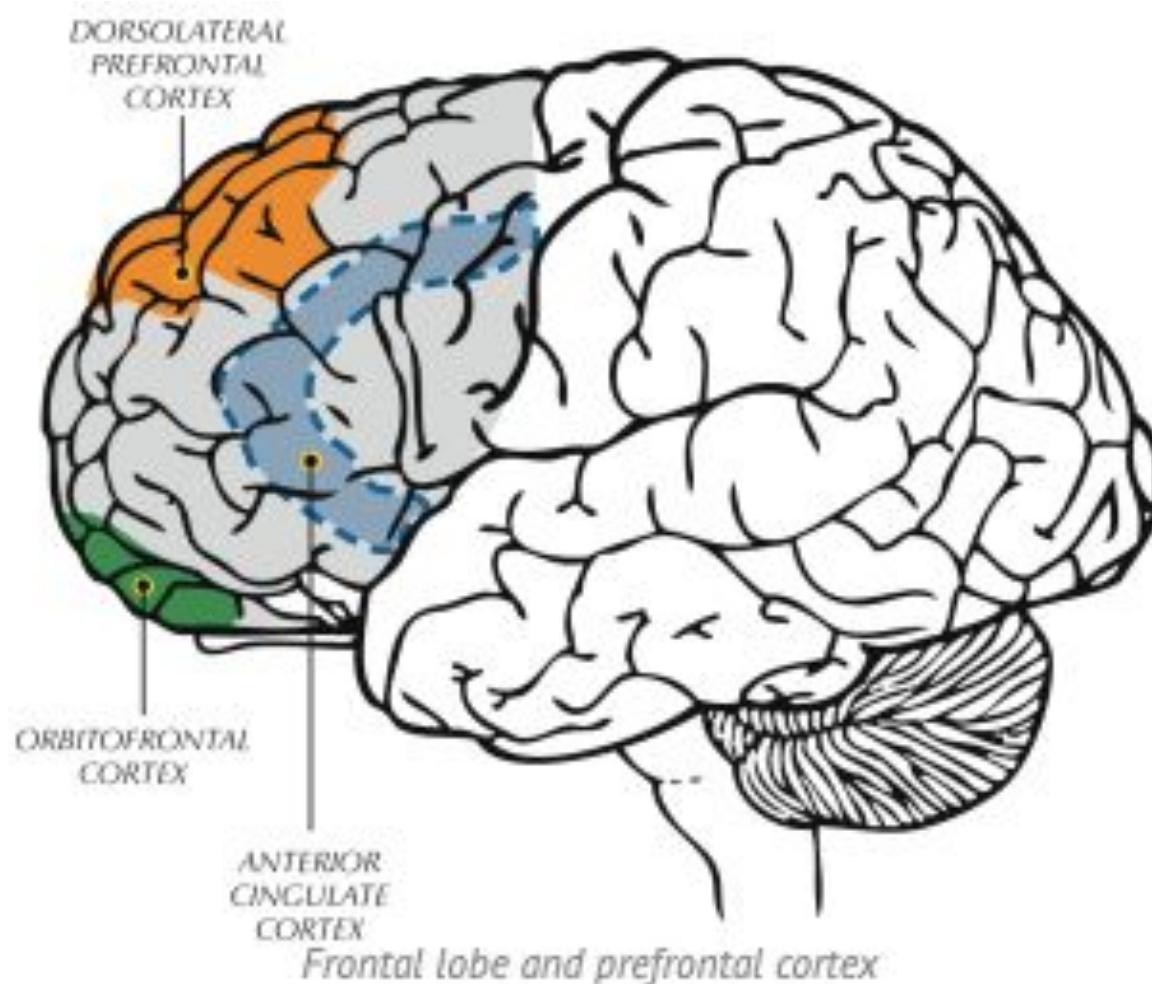
Executive functions can be defined as “the set of mental processes that help us plan, organize, strategize, pay attention to details, and manage time” (Wormeli, 2013, 41). In other words, executive functions are neurologically-based skills that involve self-regulation and one’s response inhibitions (McCalla, 2013). Although the exact components of executive functions can be disputed, for this paper I am going to focus on these neurologically-based skills that can be broken down into the categories of **working memory, response inhibition, emotional control (self-regulation), mental flexibility, sustained attention, task initiation, planning/prioritizing, organization, time management, and goal-directed persistence** (Wormeli, 2013, 41).

Since executive functions involve cognitive processes, these functions take place in the prefrontal cortex of the brain. The three parts of the prefrontal region of the brain that are involved with executive functions are the dorsolateral prefrontal cortex, anterior cingulate cortex, and the orbitofrontal cortex (see Figure 1). The dorsolateral prefrontal cortex, which is located near the top of the frontal region of the brain, is involved with the executive function skills of organization, planning, response inhibition, and working memory. The anterior cingulate cortex, which is located more towards the middle of the frontal region of the brain, is focused on self-regulation. Lastly, the orbitofrontal cortex, which is located towards the lower portion of the frontal region, is involved with response inhibition and regulating impulses (McCalla, 2013). Throughout the rest of the thesis,



I will be defining each executive function and providing unique strategies that have been proven to support executive function challenges and promote academic success.

**Figure 1:**



(McCalla, 2013)

## Sustained Attention

Sustained attention is an executive function that involves the “ability to focus on an activity or stimulus over a long period of time” (Sustained Attention: Cognitive Ability - Neuropsychology, 2019). Challenges with sustained attention can often lead students to poor academic performances because they cannot stay focused on the task at hand for the necessary period. Poor sustained attention can often be paired with the inability to complete daily tasks, as well as fatigue (Sustained Attention: Cognitive Ability - Neuropsychology, 2019). Altered sustained attention can be linked to disorders such as Attention Deficit Hyperactivity Disorder (Sustained Attention: Cognitive Ability - Neuropsychology, 2019).

Altered Deficit Hyperactivity Disorder or ADHD, can often be linked with executive function challenges because children with ADHD typically display difficulty with executive functions. ADHD is a medical diagnosis found in the Diagnostic and Statistical Manual of Mental Disorders published by the American Psychological Association. Individuals younger than 17 must display at least 6 inattentive and/or hyperactive-impulsive symptoms for diagnosis. Ultimately, nearly all children who have ADHD struggle with their executive functions; however, executive function disorders do not pertain strictly to students who have ADHD. Individuals who do not have ADHD can also struggle with their executive functions— it is for this reason that ADHD and Executive Function Disorder are linked, but not the same.

It’s that time of day again. . . math class — Molly’s least favorite part of the day.

According to Molly, there is nothing more boring than math class.

“Alright class,” Molly’s teacher called, “We are going to transition to math right now and work on problems from the book that you should have in your desk. The problems will start with addition and then they will — ”

*Of course! Addition again. Nothing easier or more BORING than that. I wish we could be doing something else. . . like science! Or maybe watch a movie? Now that would be fun. Maybe I should ask my mom to go to the movies this weekend. . . the new Toy Story movie is out.*

“Does anyone have any questions? . . . Perfect. So you can begin now and we will work for about fifteen minutes. That should give you plenty of time to finish all twelve problems and again the problems are on the page —”

*Twelve problems? Fifteen minutes? UGH! Alright, I should grab my book but. . .Wow — I never noticed how long Jenny’s hair is. Look at it! It almost touches the bottom of the chair. I wonder how I would look if my hair was that long. Why do most boys never have long hair?*

“Everyone should have their books open at this point. If you do not — Get going!”  
Molly’s teacher warned.

*Whoops. Alright, let’s start these boring problems. Here’s my book, now what page did she say to go to? Did she even say? Whatever, I’ll just lean over and see what page Mark is on. . . page 36. . . easy enough. Now did she say to write the answers in the book or on a separate piece of paper? Looks like everyone else is using a piece of paper, so let’s find a piece. This paper has a crumple in the corner though. . . wonder if I press the book down on the paper if it will get the crumple out. . .*

At the end of the fifteen minutes, Molly had completed six of the twelve problems.

Unfortunately, Molly only got three of the twelve problems correct because she not only rushed through the problems but furthermore, she missed part of the directions. The teacher had informed the class that the first three problems were addition problems, but then the rest of the problems were subtraction problems. Molly completed all six of the twelve problems by using addition.

This situation shows how Molly struggles with the executive function of sustained attention and focus. When individuals struggle with paying attention, it does not mean that they do not know *how* to pay attention, but rather that they pay attention to the wrong things (Professor Nanhoo S. Vanderhart). In this scenario, we can see that Molly paid attention to the length of Jenny's hair, what movie she wanted to see, and the crumple in the corner of her paper. Essentially, Molly paid attention to anything that wasn't math-related. Molly failed to complete the assignment and only answered three out of the twelve problems correctly because she did not listen to all of the directions that the teacher gave at the beginning.

Molly's struggles are common for students who have sustained attention challenges. The most common challenges for a student who struggles with their sustained attention include: "failing to pay attention to directions or needed information, missing important details in a conversation, having a hard time sticking with a task, and getting easily distracted while doing a task" (Branstetter, 2014, 96). So, how can we help Molly and students like her, who struggle with their sustained attention?

One of the main reasons that Molly was unable to pay attention to her math assignment was because she was not interested in it. Think about it: some students can sit in front of a TV for hours playing video games, but they cannot focus for more than a few minutes when it comes to a math

assignment. Why? Author, clinical and school psychologist, Dr. Rebecca Branstetter, explains that “it’s easier to focus on something you enjoy or feel successful doing than on an undesirable task or something too challenging” (Branstetter, 2014, 97). In the scenario above, Molly mentioned she was interested in science, so had the assignment been watching a model volcano erupt — I bet Molly would have had a lot easier time paying attention. But, what can we do? We cannot avoid teaching math; however, we can implement strategies to keep our students focused on subjects that they find undesirable.

The first thing that we can do is allow for a choice. Branstetter explains that “choice leads to motivation and motivation leads to better attention. If you give your child a choice in which tasks they start first, you may find some improved focus because she got to choose it” (Branstetter, 2014, 98). As a teacher, if I knew Molly wasn’t interested in math, I might offer her the choice of working alone or working with a partner. I might offer her the choice of doing the problems on a piece of paper or the whiteboard. Additionally, a teacher could implement math stations and allow students to choose which station they would like to work on first. Another strategy to engage students is to create math world problems that revolve around things that the students are interested in. For example, the teacher could make up a word problem that involves princesses or baseball. The teacher could also implement classmates’ names into the word problems — both strategies would pique students’ interest because it adds a bit of humor and fun into a task that might otherwise be boring.

Students who struggle with sustained attention need to learn strategies on how to self-monitor so that they can acknowledge when they are distracted and can get back on track. Some people refer to self-monitoring as it’s own executive function. Self-monitoring can also be

referred to as self-regulation or as metacognition. Metacognition can be defined as: “thinking about thinking, such as the ability to organize thinking before acting or the ability to relate information just learned to other information already stored in the brain” (Friend, 2018, 493). Author and educator, Colin Guare, explains that metacognition can also be linked with the ability to problem-solve, self-monitor, and self-evaluate because these are the skills that involve students either thinking/reflecting on past actions or thoughts or planning for future actions or thoughts (Guare, 2017, 5). Individuals who work in education typically refer to this “thinking about thinking” as metacognition, but for this paper, I will refer to it as self-monitoring.

To introduce self-monitoring, teachers should have a conversation with students first about what does it look like when they are focused and what does it look like when they are not focused. The teacher and student could then practice ways to monitor focus. This could include giving the student a task, then setting off a timer (or vibrator) randomly. Once the timer goes off, the student checks off whether they were focused or not when the timer went off. This is a beneficial strategy because it starts to bring awareness to the concept of focusing to your student (Branstetter, 2014, 97). Self-monitoring can be useful in many different situations. For example, if a student who has great self-monitoring skills reads a paragraph without retaining any information, then they would stop and acknowledge: “I did not understand what I just read. I should go back, reread, and make sure I’m focused this time.” On the other hand, a student who could not self-monitor may just move onto the next paragraph with little regard for their understanding. Questioning one’s understanding and one’s work is a great way to promote self-monitoring. Molly would have been a lot more successful had she asked herself: *Do I know the directions? Do my answers make sense? If I redo*

*the problem, do I still get the same answer? Can I think of another way to do the problem?*

Self-monitoring requires one to “actively contemplate the learning process” (Branstetter, 2014, 35).

3rd-grade teacher, Ms. E, explains that in her classroom self-monitoring can be seen through students controlling their body and actively listening while they are reading. Ms. E promotes this self-monitoring and active listening by requiring students to have “five things” every time that they read. These five things include: looking at the page, sitting up straight in their chairs, tracing their fingers on the words that they are reading, reading out loud, and thinking. She explains that students are expected to bring these five things to the table every time that they read. Additionally, Ms. E remarked that “a lot of the time we [as educators] instinctively believe that executive functions are innate abilities, but oftentimes they are not. This is why as educators we need to actively and explicitly teach and model our routines and expectations that we have set. Explicitly teaching, reading books about [expected behaviors] and modeling is extremely beneficial for promoting executive function growth in students.” Lastly, Ms. E encourages teachers to reteach expected behaviors. She believes that “reteaching expectations is good for the whole class, not just one student in particular because everyone can always use a reminder.” Ms. E acknowledges that expectations are different depending on the circumstance which is why she thinks reteaching them is so helpful. She takes it one step further by reminding students of the expectations before they start each new activity. Explicitly teaching expectations is so beneficial because when students know what is expected of them, it is a lot easier for them to stay on track and to stay focused.

Just as questioning and self-monitoring are effective in increasing sustained attention, so is incorporating “self-talk.” Self-talk involves being one’s “cheerleader” or “coach” and silencing one’s inner critic (Honos-Webb, 2018, 35). Author, clinical psychologist, and ADHD researcher,

Laura Honos-Webb, encourages one to “think of the difference between telling yourself, ‘I can’t handle this,’ and telling yourself, ‘I am calm and focused on this task’” (Honos-Webb, 2018, 35). By using positive affirmations, you are making yourself more motivated and more effective at a task. If Molly had told herself: *Even though I believe that math is boring, I can still push through this assignment because it will help me learn! I am great at math! I can complete my work!* Not only would she have been more motivated for her assignment, but she would have been focused on completing the assignment and doing a great job. A teacher can promote this positive self-talk by encouraging students to either repeat out loud or write on their paper: “I can do this,” before a challenging task. Additionally, teachers should display encouraging posters throughout the classroom that display these positive self-talk affirmations. That way, the teacher can call attention to the posters when students are feeling anxious, afraid, or unmotivated. Furthermore, it is just as important for adults to use positive talk and praise when working with students. Authors, licensed school psychologists, and parents of children with ADHD, James W. Forgan Ph.D. and Mary Anne Richey M.Ed, remark that “in teaching focus and self-monitoring. . . how you speak to your child is just as important as what you say to her” (Forgan & Richey, 2015, 107). The importance of praise is something that will be talked about later on in the paper.

Honos-Webb explains that “one of the reasons so many of us struggle to sustain attention is that our brains are naturally prone to distraction” (Honos-Webb, 2018, 33). How can we deal with distractions? The best way to deal with distractions falls under self-monitoring. Forgan and Richey remark that “kids love to multitask, but for them it means having a TV and music on at the same time they’re texting their friends and playing a video game. It’s chaos. One of the biggest things you can give a kid with focus problems is to get rid of the distractions” (Forgan & Richey, 2015,



110). Self-monitoring also requires a student to know their distractions. Often in a classroom, we hear teachers say things like: “Make a smart choice. Will you be able to get your work done if you sit next to your best friend? Pick a seat where you won’t be distracted.” These statements are leading students to self-monitor because it makes them reflect and ask themselves if they *will* get distracted sitting next to their best friend or sitting by the window. Distractions may not always be obvious to students. Therefore, it might be necessary to discuss: “What does it look like to be distracted?” Brainstorming distractions with students could be extremely beneficial in aiding them to self-monitor their distractions. Additionally, since we live in a world encompassed by technology, both parents and teachers must encourage putting away cell phones and other distracting electronics when doing school work. Forgan and Richey explain that multitasking can be dangerous for someone who struggles with sustained attention because multitasking in general causes individuals to only be partially focused on each thing (Forgan & Richey, 2015, 110). It is important for a student who struggles with sustained attention to only focus on one thing at a time.

Mindfulness goes hand and hand with self-monitoring. Mindfulness can be defined as “paying attention here and now with kindness and curiosity” (Association for Mindfulness Education, 2019). Mindfulness is observing one’s thoughts with a lack of judgment. It has been proven to improve one’s attention and focus (as well as other executive functions which will be discussed later) because it is a stress management tool that promotes optimal conditions for learning (Association for Mindfulness Education, 2019). Practicing mindfulness can be seen through activities such as meditation, yoga, or simply focusing on the breath. Mindfulness is beneficial because it helps slow down and narrow thoughts of children who struggle with sustained attention and who constantly have a variety of thoughts racing through their heads (Branstetter, 2014, 102).

Honos-Webb acknowledges that “while a little bit of stress can focus our brains, too much stress is distracting and diminishes attention. . .Stress management directly improves your attention and focus which strengthens your overall executive function” (Honos-Webb, 2018, 27). Special education teacher, Ms. J, acknowledged that she has students practice their self-regulation skills by working on yoga in class. She believes this strategy to be beneficial. If the teacher had Molly take at least five minutes to either do yoga, a guided meditation, or belly breathing, then she would have been calmer, her thoughts would have slowed down, and she would have been more successful with her math problems.

2nd-grade teacher, Ms. R, explains that the class psychologist comes in once a week to practice mindfulness. She remarked that the psychologist brings her gong and they have a mindful minute and open conversations. Ms. R. remarked, “the kids love it!” When I asked what she meant by open conversations she explained that the psychologist will ask: “Did anyone use deep breathing this week? Why did you have to use it?” The students will then go around and share stories about various times that they had to take a deep breath— such as when their little brother stole their favorite toy. In Ms. R’s class, mindfulness does not just pertain to when the psychologist comes in; she explained that one day, the students had a big forty-word spelling test and that everyone was nervous, so they all took a deep breath before they began. This deep breath limited stress and allowed students to put their best foot forward.

There is a lot more to self-monitoring than just the process of thinking. Throughout a lesson or task, the student and teacher should be working as a team and thinking about the before, during, and after phase of each task. For example: What do the teacher and student need to do *before* a task to promote sustained attention? How can the student retain attention *during* the process? *After* the

task is complete, how can the student be reinforced to pay attention next time? Let's start with the strategies for the *before* stage. In this instance, we can assume that the teacher knows Molly has a hard time paying attention to math. To start the *before* stage, the teacher should have a conversation with Molly to find out why she is struggling to stay focused in math class (which we know is that she finds it boring). Additionally, the teacher should observe and take notes on Molly. She can use a timer to discover how long Molly can stay focused before she gets distracted in math class. The teacher should take note of what is happening in the lesson when Molly loses focus. This observation could lead to the teacher realizing that Molly doesn't pay attention when something is too easy, too hard, or too long. This information will then help the teacher create the best environment for Molly to learn math.

After the teacher had a good perception of Molly's attention span in math, she should work with Molly to set a goal. Goal setting is still part of the "before" process of self-monitoring because the student has not yet started the task. Honos-Webb argues that setting goals are crucial because they "can sustain your attention by staying in touch with your goals." It's important to check in periodically to remind yourself *why* you're doing *what* you're doing, especially if the 'what' is unexciting and doesn't fall naturally within your stream" (Honos-Webb, 2018, 30). Honos-Webb further elaborates by comparing one's focus or attention to a "spotlight;" she expresses that when we set goals, we then point that "spotlight" (our focus) on those goals. Before setting these goals, the teacher must explain to Molly the importance and relevance of math to the world we live in. Molly needs to understand why math is important before she will become motivated. After that conversation, the teacher and Molly can move onto discussing goals. The goals may be academic or they may be attention-based. The teacher may say try to do three problems right in a row without

stopping (or in other words, without getting distracted). On the other hand, if the goal is accuracy, then the teacher might say to Molly, “See if you can get eleven out of the twelve problems correct.” No matter how big or small the goal may be, it will have an impact on the direction of Molly’s “spotlight.”

The *during* process of self-monitoring involves mentally checking for understanding and tracking progress. Honos-Webb explains that “tracking the progress you make toward goals helps sustain attention by increasing your motivation and drive” (Honos-Webb, 2018, 33). Tracking progress can be done through writing accomplishments down, using a checklist, or using stickers on a chart. For example, if Molly succeeded in doing three problems without distractions it would be important for both Molly and her teacher to acknowledge this accomplishment. This acknowledgment could be done verbally, or with an accomplished goals chart. If Molly put a sticker on a chart every time she accomplished a goal, then it would be easy for her to track her progress. The goals could be written on the chart so when Molly puts a sticker on the chart, it would be like checking off that goal. Tracking goals helps one to set new goals and to continue to push oneself.

When working on sustained attention, it is a great idea for the student and the teacher to have a signal for when the student is getting distracted. Forgan and Richey suggest to “see if you can develop a wide repertoire of nonverbal reminders to help students whose minds wander” (Forgan & Richey, 2015, 118). This nonverbal cue could include the teacher gently touching the student’s desk or tapping them on the shoulder. This non-verbal cue would make the child aware of the fact that they are distracted and it could redirect their attention back to the task that they should be doing. For example, if Molly completes two math problems and then her mind begins to wander,

the teacher could simply walk up and gently place her hand on Molly's shoulder. This gives Molly a silent reminder to keep working towards her goal and to get back on track.

Another crucial aspect of the *during* process of self-monitoring involves taking breaks. Think about it — Why do we have recess? It is because kids need mental breaks. Students need to have time to run around and get their energy out. Founder and CEO of *Beyond BookSmart*, the nation's leading executive function coaching company, Michael Delman M.Ed., explains that “while breaks, for us and our kids, have that element of risk, they are not optional. We all need them to maintain our energy and focus” (Delman, 2018, 140). Delman further elaborates, we need to preplan breaks because we want them to be scheduled before students become demoralized. Therefore, breaks fall into the *before* and *during* process of self-monitoring. Although it is up to the teacher, parent, or student to preplan breaks — they will occur *during* the task. Sometimes the decision to take a break will be made during the task because we can't always anticipate when we will need a mental break. One of the best ways to take a break is through physical exercise. This is because physical exercise is “a powerful way to enhance your direct attention” (Honos-Webb, 2018, 26). Honos-Webb elaborates that “research suggests there are immediate benefits to even just 10 minutes of bouncing a ball improved the attention span of teenagers, and another study showed that students who exercised for 20 minutes had a higher attention span” (Honos-Webb, 2018, 26). Whether the student's break is five minutes, twenty minutes, or even just including two minutes of physical exercise will improve their sustained attention and get them ready to be focused again when they return from their break.

3rd-grade teacher, Ms. E remarks that in her classroom they do a lot of “brain jam” breaks. She has them make a pretzel with their arms so that their arms are close to them and that they feel

safe. She has them do push-ups in their chair with their arms, so that their bottom comes off the chair. Additionally, if students are losing focus, she will sometimes have them do ten jumping jacks and then take a deep breath in. These strategies provide students with not only a mental break, but also with exercise. 1st-grade teacher, Ms. G also believes in the power of movement breaks. She explained that she typically used the website, *GoNoodle*, for these breaks because they provide the students with singing and dancing videos. Furthermore, 1st-grade teacher, Ms. O, also implements breaks in her classroom. She has strategically placed the student who struggles with executive functions in the back of her classroom so that he can implement movement breaks without distracting others. She explained that she worked with the occupational and physical therapist in her school to implement a therapy band for the struggling student. This band is placed at the front of the student's desk so that he can bounce his feet on it if he needs help focusing and getting his energy out. This information shows that movement breaks are beneficial because not only are they researched-based, but additionally, because they are being used by practicing teachers in the field.

The first part of the *after* process of self-monitoring involves rewards. According to Honos-Webb, "using rewards is one of the most effective methods for focusing your attention on your goals" (Honos-Webb, 2018, 32). By using rewards, we are once again moving that "spotlight" of attention onto our goals. Rewards can be anything; however, the rewards must be something of interest to the student such as stickers, extra recess time, iPad break, etc. For example, if Molly's goal is to stay on track and complete all of her math assignments during the week, then when she completes that goal she could be rewarded with five extra minutes of recess on Friday (if that is something that would motivate her). Rewards are not only motivating, but they also reinforce

positive behaviors. If Molly was rewarded for completing all of her math work, then she is likely to continue to complete her math work in the future.

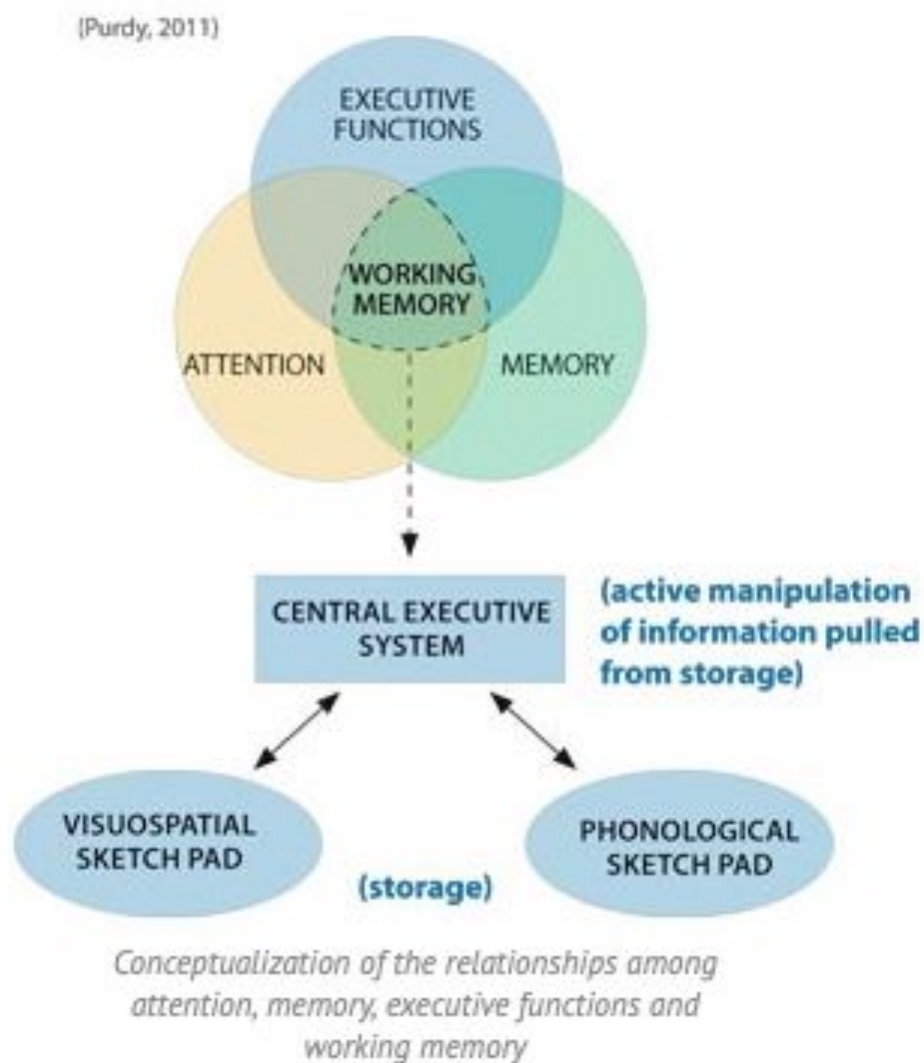
The next part of the *after* process in self-monitoring is to review one's work. By checking or reviewing our work, we are once again redirecting our focus to the original task as we scan to see if we made any errors or misunderstood anything. This is crucial for a student who struggles with sustained attention because as we mentioned above, these students are often the ones who miss directions, make careless errors, and fail to finish assignments. Delman proposes a fun way to get students to check their work through harmless bets. Delman acknowledges that "asking most kids to review their work for errors or places to improve is like asking someone who just climbed a mountain to go back down and do it again and stay on the trail a bit more perfectly;" (Delman, 2018, 146) which is why he proposes challenging a child to how "sure" they are that they have all of their answers correct or that they have finished an assignment. In Delman's example, he asks, "'Are you ten dollars sure?'" (Delman, 2018, 146). He then continued to explain to the child that if the task was "perfect" he would pay him ten dollars, but if it wasn't then the child owed him ten dollars (Delman, 2018, 147). A teacher cannot bet her students' money, but she could bet something like a homework pass, extra recess time, or something else of interest to her students. Delman's point is that this not only motivates students, but it holds them accountable and makes them self-monitor as they review their work and put their money where their mouth is.

## **Working Memory**

There is a connection between working memory and executive function skills. Working memory can be defined as "the mental activity that enables students to remember events and use hindsight and foresight based on that memory" (Friend, 2018, 169). Our working memory, or

short-term memory, contains “the ability to hold information in one’s mind long enough to process it, remember it, or act on it” (Branstetter, 2014, 113). The working memory is made up of three components that include: a central executive system, the phonological sketch pad, and the visuospatial sketch pad (see Figure 2). The main job of the working memory is to retain information that can be used to complete a task. The executive functions of the brain then access that information stored in working memory and sort through a variety of different strategies to solve problems and reach different goals (McCalla, 2013). Working memory is in charge of retaining and using new information that has been learned over short periods. This is the reason students who have working memory challenges, typically struggle with learning new material. These students cannot retain new information long enough to apply it to a new task (In Brief: Executive Function, 2012).



**Figure 2:**

(Purdy, 2011)

Molly and her classmates were wrapping up snack time and transitioning to reading. The teacher told the students to clean up their snacks, throw out all of their trash, push in their chairs, and then head to the rug. Molly started pouring the last few crumbs of her *Smartfood* popcorn in her mouth as she watched the kids around her move to the rug. Once Molly licked the last residue of popcorn cheese off of her fingers, she too headed to the rug.

“Molly! Did you listen to my directions? Go throw away your trash and push your chair in. I see a lot of crumbs on your desk, please put those in the trash too,” Molly’s teacher corrected.

“Sorry, I forgot! I just remembered that I had to go to the rug!”

Molly cleaned up her snack and then went back to the rug. The teacher continued reading, *Charlotte’s Web* out loud to the class on the chapter that they had left off.

“Molly, do you remember what the pig’s name is in the book?” her teacher asked.

“Um . . . no . . . is it Mar— no I don’t remember.”

“Does anyone else remember?”

“It’s Wilbur!” Sarah exclaimed.

The teacher then continued to read the rest of the chapter and after she had finished the students went back to their desks to work on comprehension questions. Molly struggled with these questions because she could not recall key plot events that had just been read.

Throughout this scenario, Molly struggles with her working memory. She struggles to remember directions that were just said. She struggles with comprehension questions. She cannot

recall key characters, events, or plot points from the story that was just read to her. If a student is unable to remember simple directions or struggles to answer comprehension questions correctly, then these are indicators that a student has challenges with their working memory (Forgan & Richey, 2015, 57). Other signs to look for in a student who struggles with their working memory include: forgetting the sequence of operations when solving math problems, forgetting to turn in homework that they spent a long time on, struggling to remember two-step directions, forgetting sports equipment when they show up at practice, or incorrectly relaying a message (Forgan & Richey, 2015, 57). Working memory is something that affects all aspects of our lives which is why it is so important to provide students with strategies to support such struggles.

In this scene, we can see that Molly struggled to remember the directions. As a teacher, if I was aware that Molly struggled with her working memory, then I could make it a point to give Molly extra support when it came to remembering directions. I could say to her, “Molly did you hear those directions? Could you repeat the directions for me?” By doing this, it allows you to see what directions Molly recalls and what directions she needs to be repeated— rather than repeating the entire set of directions to her (Branstetter, 2014, 117). This also forces Molly to stop and self-reflect, as she tries to recall whether she knows what she should be doing.

Since students who struggle with their working memory typically struggle with multi-step directions, teachers should consider breaking these steps down for those students. In other words, have the student complete one task at a time before they move onto the next one (Branstetter, 2014, 117). For example, the teacher could have checked in with Molly and said: “Molly did you finish your snack? Alright, now let’s throw it in the trash. Okay, now push in your chair.” This strategy, although effective, is time-consuming. Teachers cannot focus so heavily on one child when they

typically have twenty to twenty-five students to worry about. Therefore, another strategy is to use visual reminders as well as auditory reminders. If cleaning up after snack is typically a routine that Molly struggles with, then the teacher could create a picture chart of the steps that go into cleaning up one's snack and getting ready for reading. She could have a picture of a trash can, then a chair pushed in, and then the rug. Rather than ask Molly if she did all of those things, the teacher could then say, "Molly please check your snack time chart and make sure all of the steps are completed." By doing this it puts more ownership on Molly and allows the teacher to focus on the class as a whole while still supporting Molly. This strategy is great because it not only breaks down multi-step directions, but it provides that visual component.

These multi-step directions visual charts can be applied to any schedule or routine that a child struggles with. The assistant principal and kindergarten teacher, Ms. B, used this visual strategy when she worked with a student who struggled with their organizational skills. She explained that the student had a "picture/ velcro sticker schedule attached to the front of a three-ring binder. He set the schedule up by looking at the class schedule listed on the board for the next day, and putting his own together." When asked if this picture schedule strategy was successful, Ms. B remarked that by January, "the child knew the classroom routine, and stopped using the binder schedule on his own." Ms. B repeatedly used these visual storyboards and visual prompts for this student and found them quite successful.

Below are the visual reminders that were created by Taryn Miller BCBA and used in Ms. B's classroom for the particular student who struggled with his executive functions (see Figure 3):

**Figure 3:**

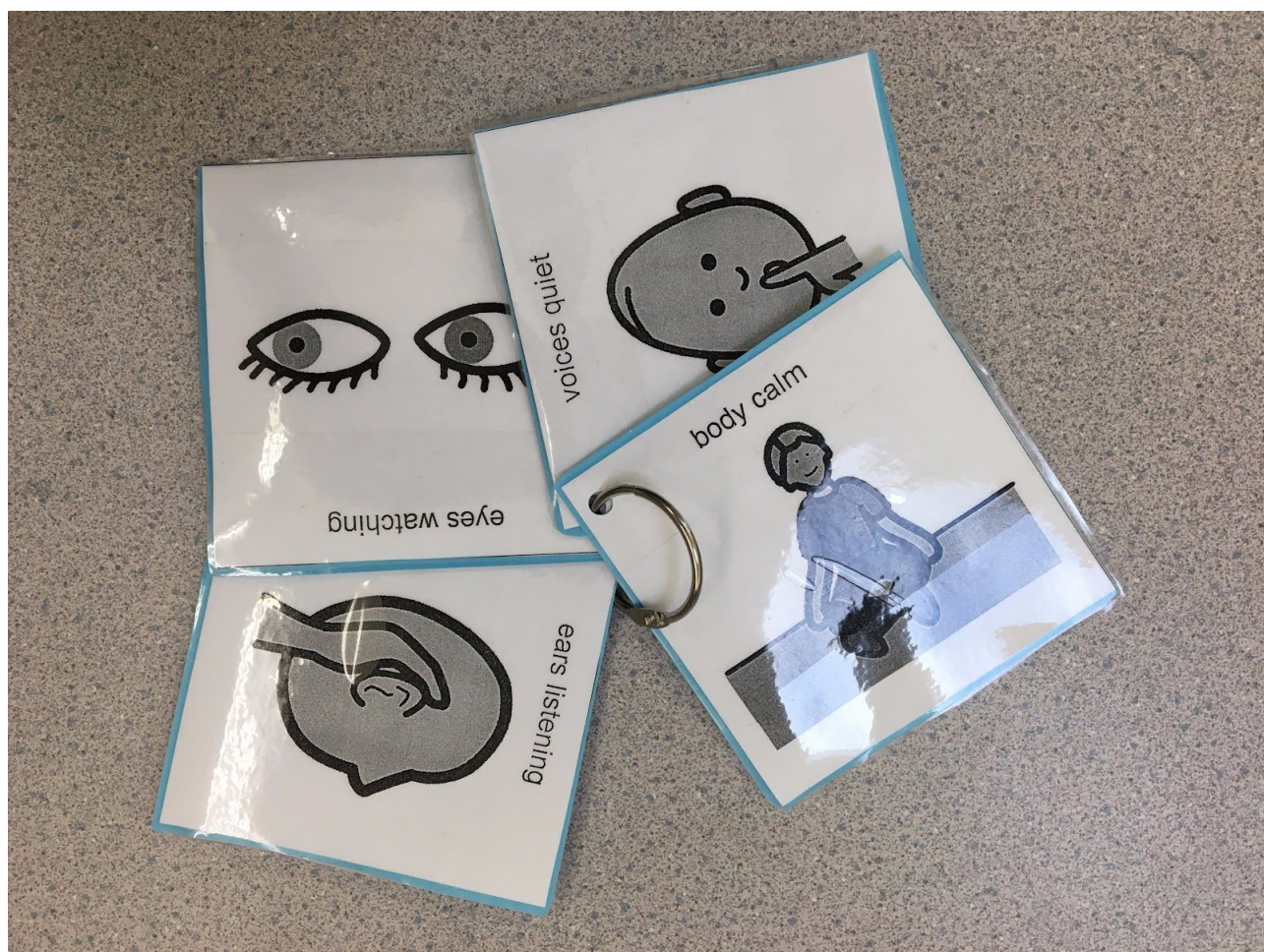
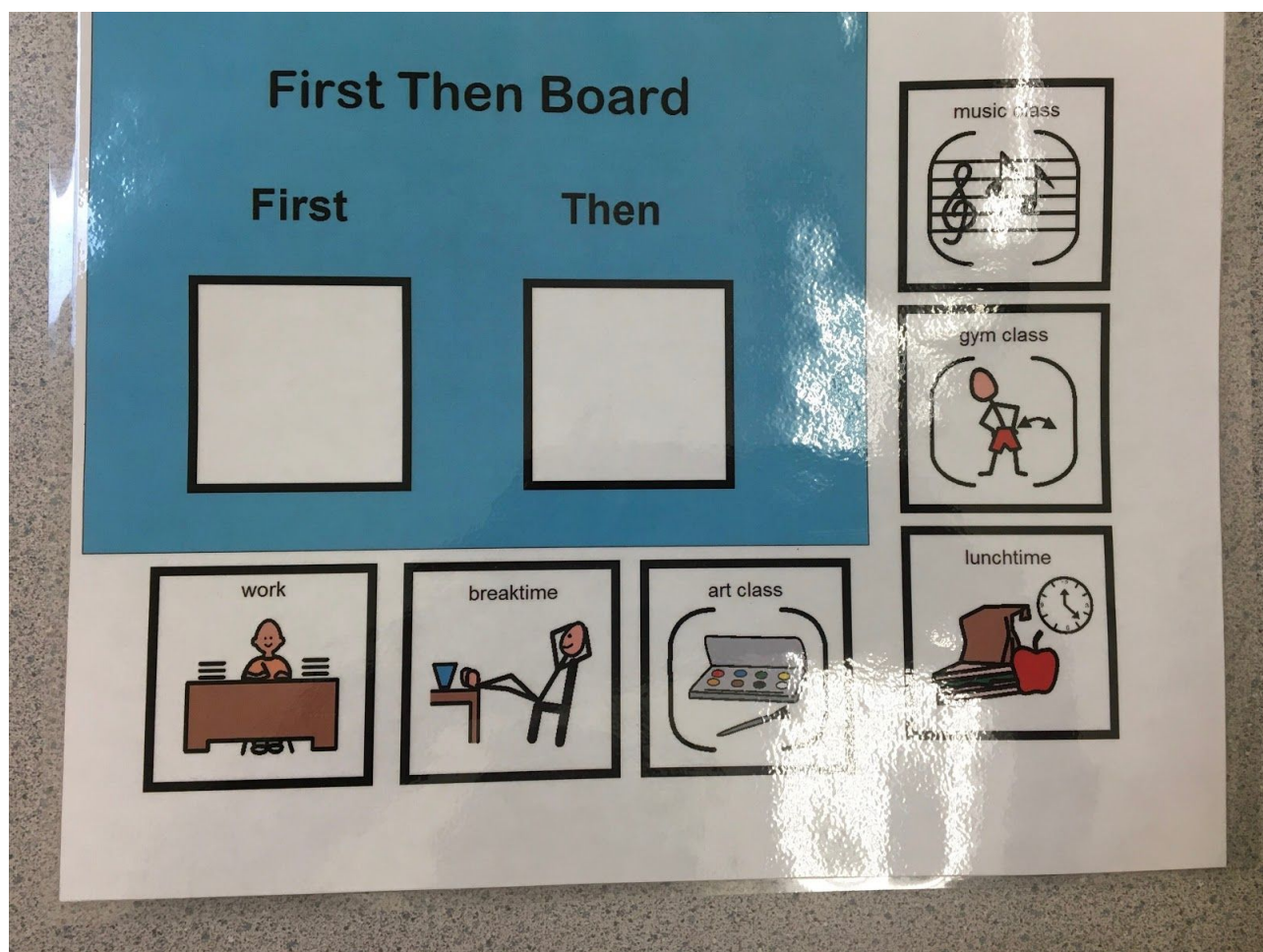
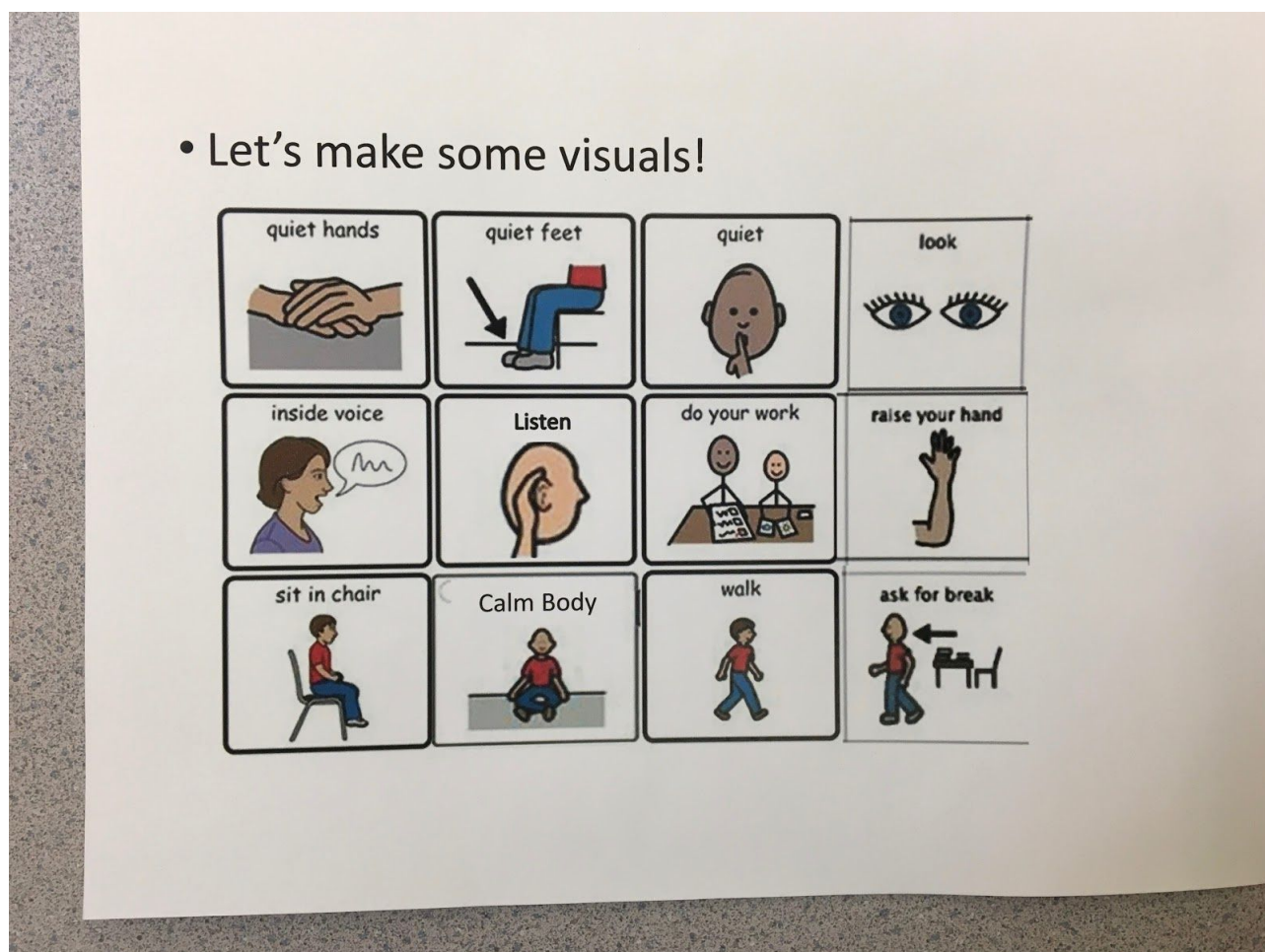




Figure 3:



**Figure 3:**

Additionally, Ms. B worked with Elizabeth Wiseman, a public school speech teacher who created the following visual schedule and reminders for that same student (see Figure 4):

Figure 4:

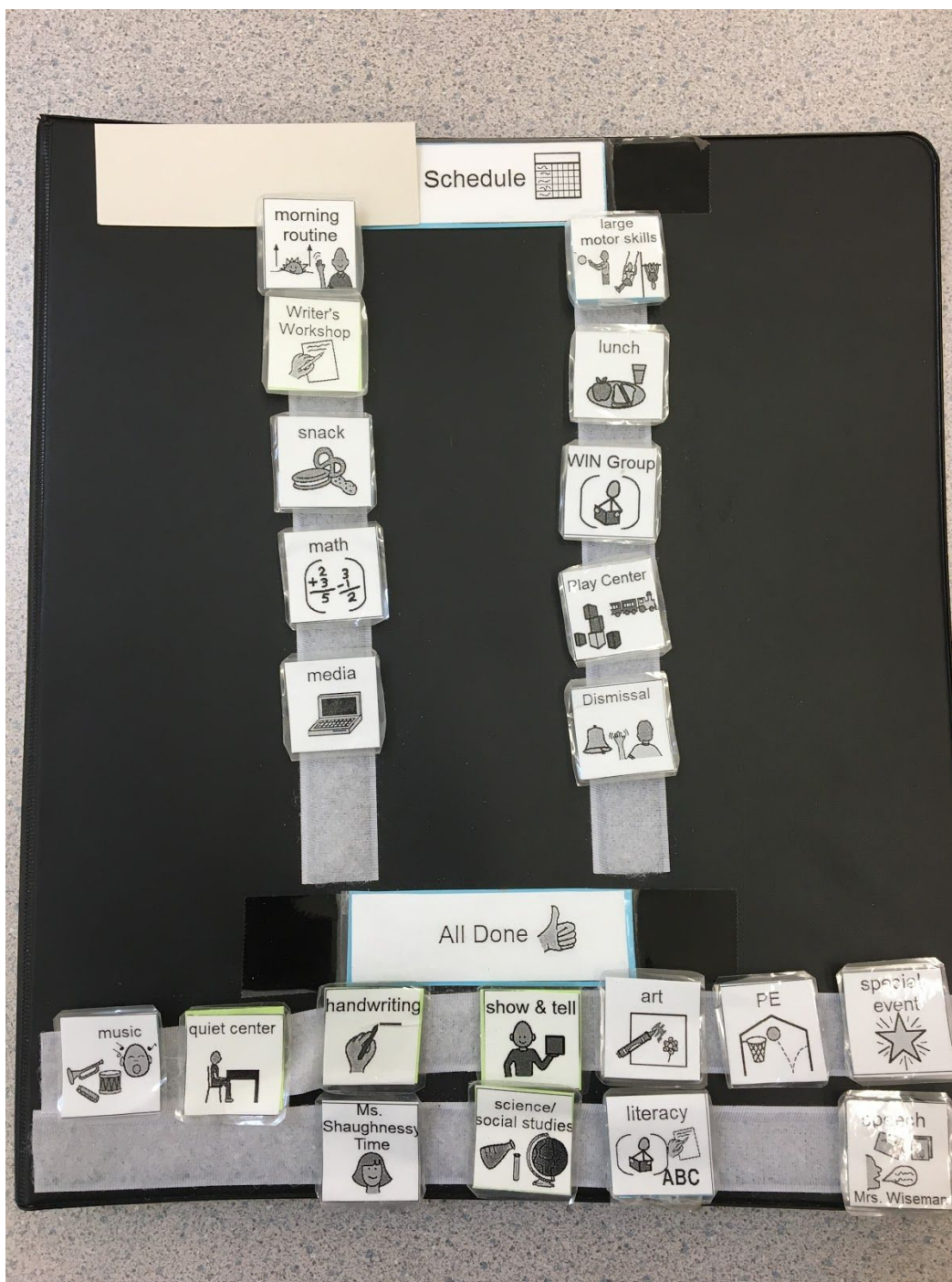




Figure 4:

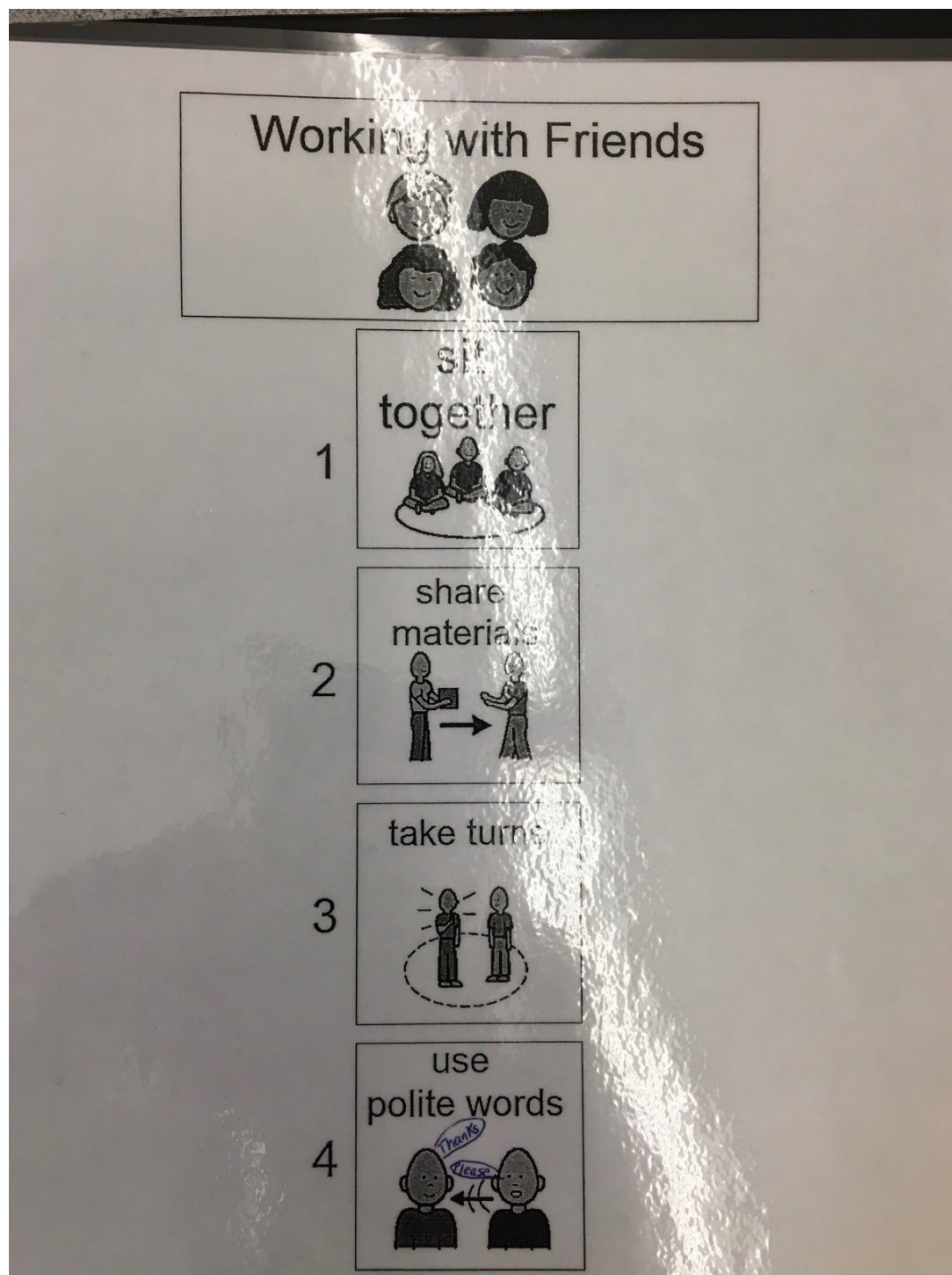


Figure 4:

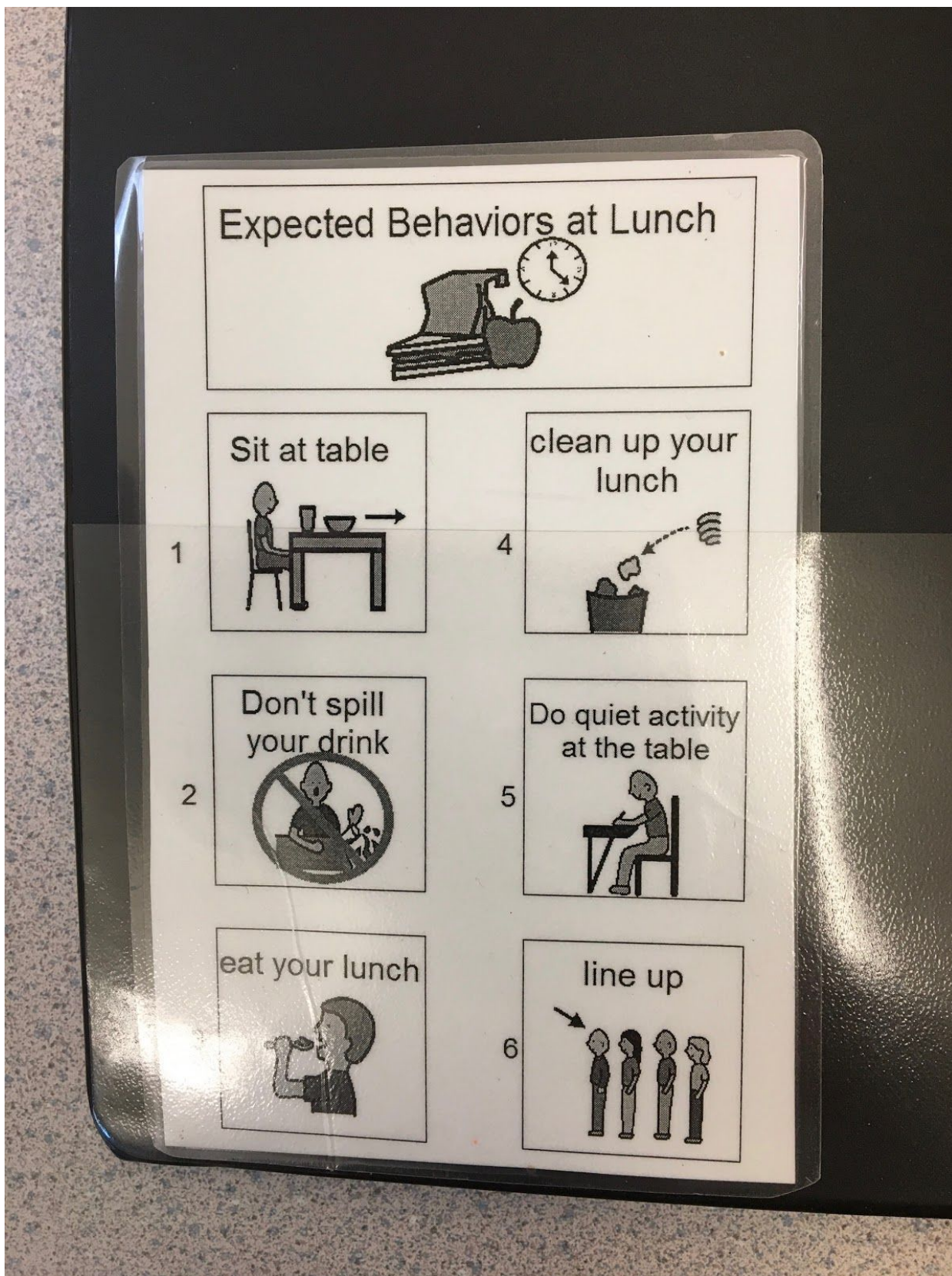
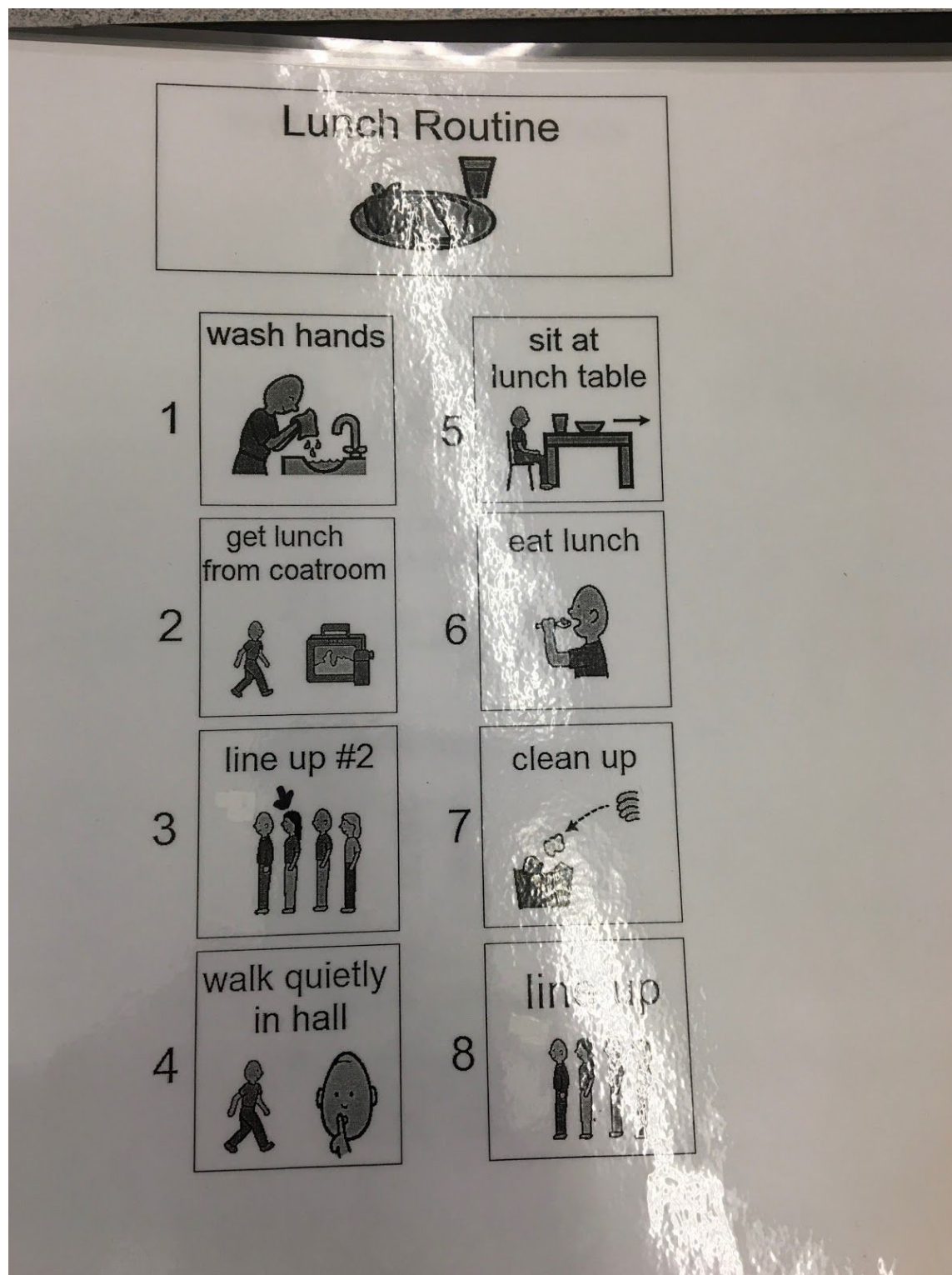




Figure 4:



3rd-grade teacher, Ms. E, explains that she consistently uses multiple modes of communication in her classroom. She explains that this strategy aids working memory because students get to both hear the directions and see them visually written down. In her classroom, she explains that a written checklist of multi-step directions has been helpful because students can see everything that they need to accomplish to complete a routine or task and they can then check off steps that have been completed. Additionally, she suggests having students chorally repeat back directions to the teacher. She explained that she usually has the whole class repeat the directions back, but sometimes she will have one student who typically struggles repeat them back to her privately. She explains that checking in with the individual student who is struggling and supporting them in multi-step directions has been beneficial.

Another important strategy is teaching students to write things down. Branstetter explains that “there are some kids who also grossly overestimate what they think they can remember. These are the kids who say that they don’t need to write things down, but then they end up not remembering the assignment. . . The key message that you have to teach your child is that he cannot rely on his memory alone; he needs to write things down” (Branstetter, 2014, 118). Even if one doesn’t specifically have challenges with their working memory, everyone struggles with their working memory from time to time. This is why we must write things down. Teachers must encourage students who struggle with their working memory to write down their homework (and the directions to their homework) in their agenda. This sets the students up for success because when they go home and forget what their homework is they can then refer to the agenda for a reminder. Now, just teaching students to write down their homework, directions, or field trip reminders, isn’t always enough in elementary school. As teachers, we first support the development

of routines for students. For example, a teacher can contact families and have them sign their child's assignment notebook showing that families worked with the child to review their assignments and reread directions before completing homework. We hope that with this support, writing down homework in the student's agenda will then become a routine as they continue throughout their schooling.

For older elementary school students, writing things down can become a great study skill. Teachers can encourage students to make flashcards of terms or concepts that they need to know so that they can focus on recalling information rather than on recognition (Branstetter, 2014, 122). Too often, students think that if they look at a study guide and "recognize" terms or concepts, then they will remember it— however, this is not the case. Students need to focus on actually recalling information and this is very easily done with flashcards. Students can look at a term that they wrote down, take a minute to recall the definition, and then flip it over to see if they can remember the definition.

Mnemonics is another great strategy for students who struggle with their working memory. A mnemonic is: "a clever way to remember information, such as an acronym, poem, or song about what is being learned" (Branstetter, 2014, 121). For example, Molly could have sung to herself, *"finish snack, throw out trash, push in chair, then sit on the rug."* If Molly struggled with remembering her homework, lunch, and book, then she could say to herself before she walked out of the door: "Am I a hungry little bear?" This phrase incorporates the "h," "l," and "b" of homework, lunch, and book— so it is a friendly reminder to Molly to self-reflect on whether she has everything she needs. Branstetter explains that "research shows that children (and adults) learn information better when it is funny, in song, or meaningful/relevant. This is why it is important to

help your child come up with his own mnemonics” (Branstetter, 2014, 121). As a teacher, we can observe if our students struggle with remembering directions or forgetting homework and then we can teach them about mnemonic devices and encourage them to come up with one that will help them be successful. Then we can use that mnemonic device as a cue or reminder to redirect our student back on track. 3rd-grade teacher, Ms. E explained that she often has students sing and dance in her classroom when remembering domain-specific knowledge. She believes that this is also a great strategy because it gets out students’ wiggles and their stress.

If a student’s working memory affects their comprehension skills, try using think-alouds during whole group readings. As a teacher, model asking questions, making predictions, and connections. For example, while reading *Charlotte’s Web*, the teacher could say things like: “What does the word *spectacular* mean?” “Why do you think Fern wants to keep Wilbur so badly?” “I think that Charlotte is trying to befriend Wilbur.” Think-alouds are great because they keep students engaged through answering questions and sharing connections. Additionally, they teach self-monitoring skills when reading. Graphic organizers are also a great strategy for increasing comprehension. Teachers can provide graphic organizers for students to write down key characters, events, problems, and plot points. This will make it easier for the student to recall when answering comprehension questions (this suggestion is from my own educational experience).

Lastly, just as I mentioned with sustained attention, Honos-Webb encourages limiting stress and getting exercise. She acknowledges that “research has shown that memory, focus, and concentration are increased by exercise and impaired by stress” (Branstetter, 2014, 25). This is why it’s crucial to get moving and to meditate or focus on our breath to limit stress.

## Emotional Control

Self-monitoring or “self-regulation” not only pertains to academics but additionally, it pertains to controlling our emotions. Some people refer to this aspect of self-monitoring as, “emotional control” which is what I have chosen to use throughout this thesis. Emotional control is the ability to regulate our emotions to complete a variety of tasks (Friend, 2018, 169). In simpler terms, emotional control is the ability to manage our frustrations and anxieties in a calm manner (Delman, 2018, 90). When students are unable to control their emotions it often leads to an explosive episode or a complete shutdown. However, emotional control does not just refer to controlling tantrums, but additionally, it is about managing anxieties, frustrations, sadness, or worries (Forgan & Richey, 2015, 83). This is why students must have the ability to calm themselves down — so that they can stay on task and continue to learn.

It was gym class. Molly and her classmates were outside playing soccer. Molly was running to help her goalie defend the net when all of a sudden, she got hit in the back with the soccer ball.

“Ouch!” Molly screamed, “Watch it!”

Molly was furious. She was bright red. *How dare someone hit her!* She was so mad that she pushed Billy, who was running beside her, on the ground.

“Hey! What’d I do?” Billy asked as he got up from the ground, wiping off his knees.

“Molly you’re out of the game!” the teacher called.

“What! Why? I’m the one who got hit! That person should be out of the game!”

“That was an accident. You just voluntarily pushed Billy. Take a seat.”

Tears started to fall down Molly’s face as she walked to the bench. Her breathing was

heavy and her heart was racing— she almost couldn't catch her breath.

“Molly why don't you go take a walk to the nurse. Lie down there and take a minute to catch your breath. You can be back in the game next class.” her teacher said.

“O-o-o-oh-okay” Molly stuttered as she walked back into the school and tried to catch her breath.

In this story, Molly struggles with her emotional control. Emotional control is an important executive function because it allows us to communicate with others safely and calmly. Molly was not able to control her emotions in her gym class— she felt everything from shock, to anger, to sadness, to even being unable to catch her breath. Molly's lack of emotional control caused her to lash out at Billy and get kicked out of the game. What if Molly acted on emotions like this when she is older and has a job? If Molly disagreed with her co-worker and then pushed them to the ground— she'd end up in jail! Being able to control one's emotions is a crucial part of being a functioning member of society. How can we help a student like Molly?

The first step in controlling our emotions is defining what it is that we are feeling. To some people, recognizing how one is feeling is obvious— if I'm crying, then I must be sad! Unfortunately, this isn't always the case— sometimes we cry when we are angry, or anxious, and or even happy! This is something that should be explained to younger children. Emotions are not that black and white and dealing with emotions is not easy (no matter how old you are). For this reason, it is imperative to *teach* elementary school students about different emotions and to teach them the best way to handle those emotions.

Teaching emotions can be done in many different ways. It can first be taught in an open conversation. For example, ask students: What does it mean to feel sad? What is the best thing to do



when you are sad? It would be beneficial for a teacher to take it one step further and share about their own emotions and how they deal with them. A teacher might say, “You know, sometimes I feel sad when my kids are fighting because I just want them to get along. When I feel sad, I like to just be alone for a bit. I like to light a candle that smells like cupcakes and read my favorite book as I lay in my cozy bed. This helps me calm down and feel happy again.” By having this conversation, the teacher is normalizing talking about emotions. She is acknowledging that she too feels sad sometimes and that it’s okay. Additionally, she is stimulating self-reflection as she shares her coping strategies for when she is sad. During this conversation, it would be great if the teacher created an anchor chart of different emotions that we feel and included strategies for how to cope with those emotions. Special education teacher, Ms. J practices teaching emotions in her classroom. She explains that her students “learn about different coping mechanisms and that they participate in social skill lessons where they learn self-regulation techniques.”

Another approach to teaching emotions is through literature and discussing how different characters are feeling. Forgan and Richey acknowledge that “books provide a concrete way for students to relate to a character’s experiences” (Forgan & Richey, 2015, 86). Branstetter elaborates on this by saying; “even if the book is not geared in particular to teach feelings, you can talk about characters in books and their emotions as you read together. You can ask your child to think of a time when he felt the same way as the character in the story” (Branstetter, 2014, 151). It is great to have students relate to how characters are feeling in a story because it teaches them to self-reflect on their own emotions and experiences.

As a teacher, we can assist children who struggle with their emotional control by labeling their emotions for them. If I had said to Molly, “I noticed that after you got hit with the soccer ball

you got very angry and upset. Can you tell me more about what you were thinking about?”

Branstetter explains that “by noticing the behavior and then exploring the attached emotion, you are helping your child make the connection between events and feelings” (Branstetter, 2014, 152).

Overall, it is most important to create a safe and non-judgemental environment when discussing emotions. Teachers should work to encourage their class to support their peers and how they are feeling. Teachers should strive to break the negative stigma around being emotional.

Another way to deal with emotions goes back to the idea of mindfulness. Students should learn strategies to meditate or sit with their thoughts in a non-judgemental manner. When the teacher noticed that Molly was so upset, he could have said; “Okay Molly, let’s take a step back. Take a deep breath in. . . and exhale out. We will do this three times.” Focusing on our breath is at the heart of meditation because it creates space between us and our thoughts. Meditation allows us to be fully present in the body without judgment. Honos-Webb encourages us to first label and acknowledge the feeling that we are having. Then she explains to say to ourselves: “it’s okay to feel mad/sad/anxious/upset.” Next, one should put their hands on their belly and practice deep breathing while allowing oneself to feel that emotion without letting it engross our energy (Honos-Webb, 2018, 90). Focusing on our breath is a great strategy for controlling our emotions because it physically calms our central nervous system (Honos-Webb, 2018, 90). It is natural for our mind to wander during meditation, so teach students to just say “thinking, thinking, thinking” and teach them to redirect their attention to the breath when they find themselves lost in thought and their mind racing. This act of labeling thoughts, “thinking,” allows us to create that distance from the thoughts or feelings that are stressing us out at that moment (Mindfulness Coach, Christine O’Shaughnessy). It is important to teach our students to not identify with their emotions. For

example, they are not an angry kid or an anxious kid, but rather they are feeling angry or anxious at that moment. Teach students to say, “At this moment I am feeling angry and that’s okay.”

As I mentioned previously, teachers must create an environment where talking about and reflecting on one’s emotions is encouraged. Teachers could create mini charts or a “feeling thermometer” (as Branstetter suggests) for students to leave on their desks. These thermometers could have an arrow or a mark to indicate which emotion the student is feeling and they could rate how intense they are feeling the emotion on a scale from 1-10 (10 being feeling this emotion the most). If the teacher notices that one of the student’s markers is directed towards angry or sad, then they could pull the child aside later and discuss why they are feeling that way. Another approach is for the students to keep journals. Every day the students could write a few sentences in their journals about how they are feeling and why. Branstetter supports these strategies when she explains that:

Children with difficulties with emotional self-regulation profit from frequent check-ins about how they are feeling. Tracking positive, negative, and neutral feelings with enhance feeling vocabulary as well as build awareness of the connection between events, thoughts, and feelings. Once children are able to express how they feel, they are better able to handle their feelings (Branstetter, 2014, 153).

Tracking our emotions is not something we consciously do; however, for a student who struggles with emotional control, frequent check-ins are extremely beneficial. These check-ins create awareness, enlighten students to connect events and feelings, help identify triggers, and encourage calmly coping with emotions.

As teachers, we must reinforce positive behaviors and discourage negative behaviors. This positive reinforcement strategy can be beneficial because it encourages students to handle their emotions more calmly. If a student struggles with their emotional control, it is beneficial for a teacher to set up a system of rewards and consequences (Forgan & Richey, 2015, 86). Let's think back to Molly in gym class— she did not handle her emotions well. If the teacher had set up consequences for every time Molly lashed out, then she would have lost a privilege that she cared about, such as iPad time, for demonstrating that behavior. If Molly loves her iPad time, then losing it as a consequence will more than likely reduce the chances of her lashing out in class again. Consider if Molly had acted differently in gym class: what if Molly still got hit with the soccer ball, she still yelled “watch it!” but then she took a deep breath, kept running, and did not let the anger overcome her. If this was the case, then Molly should be rewarded for this behavior. If Molly is praised and rewarded for this behavior, this will reinforce her to take a deep breath next time she feels that she is going to lash out.

Praising students is crucial in promoting positive behaviors. Additionally, the amount that educators praise students is important. Research shows that there should be a ratio of 5:1 for the amount of praise and criticisms we provide for our students. For example, if we tell Molly, “You are being too loud,” we then need to make an effort to praise Molly (ideally) five times. This 5:1 ratio has been found to decrease disruptive behavior and increase academic engagement (Ottinger, Cook & Haggerty, 2015, 5). Furthermore, this 5:1 ratio promotes a positive classroom environment and fosters teacher-student relationships (Ottinger, Cook, & Haggerty, 2015, 4). The goal is for the teacher to have more positive interactions with the student than negative interactions.

## Mental Flexibility

Mental flexibility refers to the ability to “sustain or shift attention in response to different demands or to apply different rules in different settings” (In Brief: Executive Functions, 2012). Mental flexibility works closely with self-regulation and working memory so that students can remain calm as they adapt to different environments and perform a variety of different activities (In Brief: Executive Functions, 2012). In a school setting, mental flexibility involves the ability to “revise plans, move freely from one step/activity/situation to another; transition between tasks easily” (McCalla, 2013). Students who are not mentally flexible, may get upset or become dysregulated when plans or routines are changed and additionally, they may struggle with the ability to problem-solve (Rosen, n.d.).

It was the afternoon and Molly’s teacher was reading *Charlotte’s Web* to the class. Molly loved this part of the day because she could just sit and relax against the pillows on the rug and listen to the story. Wilbur was just about to meet Charlotte in the story when all of a sudden the fire alarm went off. The entire class was startled. Students whipped their heads towards the teacher— asking with their eyes whether this was a fire drill or not.

“Alright class, you know the routine. Line up single file at the front door. We are going to walk silently down the hall then, down the stairs. Once we are outside, we will line up against the fence. Remember to be silent when we are outside” the teacher announced.

“Is this a drill?” Billy called.

“Yes, this is a drill Billy— but we should still take it seriously.”

Molly was beside herself. She couldn't believe that this was happening— especially since it was a fire *drill*.

“I don't want to go outside!” Molly cried, “Let's keep reading! We aren't going to have time when we get back because we have art! Please!”

“Molly, staying inside is not an option” the teacher declared.

Molly sobbed the whole way out. Once she was outside, she sat down off to the side with her head in her knees. The rest of the day did not go well. Molly would not participate in art. She refused to complete her math worksheet and she repeatedly asked if they could finish reading where they had left off.

Throughout this scene, Molly struggled with her mental flexibility. When the plans or the “everyday” routine that Molly was used to changed— she could no longer function. The fire alarm was unexpected for Molly and it was hard for her to shift gears and go with the flow. This is often the case for students who struggle with their mental flexibility. They get upset when plans change, have a hard time transitioning from one activity to the next, do not do well with a substitute teacher, cry if they cannot be first in line, and have trouble thinking outside of the box (Forgan & Richey, 2015, 80). Assistant principal and kindergarten teacher, Ms. B, too struggled with a student who had executive function challenges and who longed to be first in line. Ms. B explained that: “The child had extreme anxiety and persistent noncompliance behavior if he was not first for everything. The ABA specialist and I came up with the idea of a caterpillar for the classroom door with a body part for Monday, Tuesday, Wednesday, Thursday, and Friday. Each day was assigned a position in line that the child agreed to (Monday, 1st; Tuesday, 5th; Wednesday, 4th, etc).” When I asked Ms.

B if this strategy was successful, she remarked that the child; “Followed the line-up schedule and never asked to be first on the other day.” This consistent and predictable routine helped Ms. B’s struggling student to become flexible and accept not being first all of the time.

Forgan and Richey define mental flexibility in terms of being “resilient.” They explain that “this means that the children can bounce back from disappointments, handle stress, generate solutions to problems, and remain positive” (Forgan & Richey, 2015, 82). Honos-Webb defines mental flexibility differently, by comparing it to having a “growth mindset.” Honos-Webb explains that “people with a growth mind-set generally believe that with practice and application, they can work to change things like organizational ability, and thus grow beyond their limits (Honos-Webb, 2018, 68). She also explains that students who struggle with their mental flexibility have a “fixed mindset.” Psychologist and author, Carol Dweck, defines a fixed mind-set as “the belief that behavior patterns and thoughts are essentially unchangeable characteristics” (Honos-Webb, 2018, 68). How can we teach our students to be resilient or to have this growth mindset?

One thing we can do as educators to encourage a growth mindset is to be conscious of the praise that we are giving. In 1998, Mueller & Dweck did a study on praise where:

Researchers asked 400 fifth graders to take an easy short test, on which they all performed well. Half of the children were then praised for ‘being really smart.’ The other half were complimented on ‘having worked really hard.’ The children were then asked to take a second test and choose between one that is pretty simple, that they would do well on, or one that was more challenging that they might make mistakes on. Ninety percent of

those who were praised for their effort chose the harder test. Of those praised for being smart, the majority chose the easier test (Boaler, 2016, 8).

In this study, Dweck is showing that as educators we must learn to praise our students for being “great problem solvers,” or for “working really hard even when it was challenging.” We must praise their efforts rather than their talents. Author of *Mathematical Mindsets*, Jo Boaler, explains that “praise feels good, but when people are praised who they are as a person (“You are so smart”) rather than what they did (“That is an amazing piece of work”), they get the idea that they have a fixed amount of ability” (Boaler, 2016, 8). Therefore, the first thing we can do as educators to promote mental flexibility and to promote this growth mindset is to praise students on their *work*, not their intelligence.

Branstetter touches on this fixed mindset in which she talks about how students who struggle with mental-flexibility approach problems. She explains that this student (with a fixed mindset) would try to solve a math problem by using the steps that the teacher gave in class. Once this student realizes that these steps do not work, rather than try a new way, he/she will continue to use these teacher-taught steps to try and complete the problem. Additionally, Branstetter argues that if a different student suggests a new way to approach the problem, the child will more than likely get upset because that way is “not how the teacher taught it” (Branstetter, 2014, 128). This situation is easy to imagine in the classroom which is why it is so important to set up a classroom environment where you encourage students to be problem solvers, to think outside of the box, and to try multiple approaches to figure out the same problem. If a student is praised for their efforts and is encouraged to be a problem solver, then more than likely this situation will be avoided and the student will try a new approach to solve the problem without getting upset.



Another strategy for promoting mental flexibility is through teaching different perspectives— this can be done through literature. Teachers can read stories to students that promote seeing two sides to a story or that encourage students to think in a way that they never have before. An example of this could be teaching about Christopher Columbus through the eyes of the Native Americans that he encountered, The Tainos, and through the eyes of white colonists. This forces students to put themselves in the shoes of two different perspectives. Honos-Webb explains that when we look at different perspectives, we emerge out of the box that we have created for ourselves and allow room for flexible thinking (Honos-Webb, 2018, 74).

As a teacher, if we know that our students struggle with mental flexibility, it is important to provide these students with a consistent, predictable daily routine (Forgan & Richey, 2015, 84). For these students, it is helpful for them to know what to expect throughout the day because it keeps them regulated and it gives them a sense of security. It is also important to inform students ahead of time when there is going to be a change in a daily routine. When there is a change in a daily routine, it can often be upsetting to a student who struggles with mental flexibility (Branstetter, 2014, 130). This is what we saw with Molly. The fire drill made Molly extremely upset because she was not prepared for it. Molly is used to having reading at that time and she couldn't shift her mind-set to perform a different task. Both Branstetter and Forgan & Richey encourage informing a child who struggles with mental flexibility of a change in schedule ahead of time so that they have more time to prepare. Branstetter remarks that "talk about the change and you may be able to prevent him from getting upset (Branstetter, 2014, 131). Next time there is a schedule change, Molly's teacher needs to inform her earlier to decrease the chance of a meltdown.

We must teach our students that failure is okay and that it is just a part of learning.

Honos-Webb explains that “accepting failure can give you a sense of freedom by forcing you to try something outside your comfort zone and expertise. When you lose your fear of failure, you gain the power to experiment in life and work, and experimentation leads to innovation and discovery” (Honos-Webb, 2018, 76). If we let students know that it is okay to fail as long as they try their best, then they will be more likely to take risks, try problems a different way, and to think outside of the box. It is also important to praise students when they are flexible or when they think outside of the box. Forgan and Richey explain that “if we want our children to value and recognize flexibility, then we have to praise them and call attention to it when they are” (Forgan & Richey, 2015, 86). Just as I mentioned before with Dweck, how we praise students is important. Teachers should praise students for their work, not their intelligence or their abilities. For example, a teacher should say things like: “Molly, I love how you switched gears in such a calm manner.” “Molly, I love how you solved that problem in three different ways,” or “Molly, I love how you transitioned so nicely from math to science.” By praising our students when they are flexible, we are reinforcing this behavior so that they will continue to do it in the future. It should be our goal as teachers to praise the students on their process and their problem-solving skills, rather than on their intelligence.

## **Goal Directed Persistence, Planning, Prioritizing & Time Management**

Goal-directed persistence can be defined as “the capacity to have a goal, follow through to the completion of the goal and not be put off or distracted by competing interests” (Guare, 2017, 5). In other words, goal-directed persistence involves the ability to set smaller goals to help one work

their way up to achieving their bigger or ultimate goal (McCalla, 2013). Students who have goal-directed persistence are more likely to stay on track to their original plan in accomplishing a task. Furthermore, these students can push through adversities and challenges that come along the way to that goal. Goal-directed persistence is closely tied with the ability to plan/prioritize, stay organized, and manage one's time. Students who struggle with goal-directed persistence may be unmotivated in starting new tasks and may have a hard time understanding the consequences or long term outcomes.

Speech and language pathologist, Angie McCalla, defines planning/prioritizing as “spontaneous use of planning behaviors in novel tasks; anticipate future events; grasp the main idea; prioritize, reduce/cluster information, re-arrange material or information” (McCalla, 1, 2013). Additionally, the ability to plan revolves around knowing what task or events come first and what then must follow (Gendron, n.d). Planning is also known as “reconstitution,” which author and special education professor/ researcher, Marilyn Friend, believes is the ability for “both analysis and synthesis” (Friend, 2018, 169). Analysis has to do with the breaking down of something into its smaller parts and then synthesis refers to combining those parts to take action, (Friend, 2018, 169). For example, analysis could refer to a student breaking down a teacher's directions into smaller steps (such as: first grab a piece of paper, next put your name in the top right corner, etc.) and synthesis could refer to the student then doing all of those steps in order to complete the activity that the teacher assigned. Typically students who have planning/prioritizing challenges are unable to find an efficient way to complete tasks, cannot identify what is important, fail to manage their time, complete tasks in an “illogical order,” and do not see consequences, (Gendron, n.d).

Time-management is linked closely with organization and planning/prioritizing because it has to do with the ability to use one's time wisely. Time management can be defined as "the capacity to estimate how much time one has, how to allocate it, and how to stay within the time limits and deadlines. It also involves a sense that time is important" (Guare, 2014). Time management is a crucial skill for students to master because it is a lifelong self-control skill. Students need to learn to be able to balance their academic and social lives (Rappaport, n.d). Students should be able to develop a schedule, estimate the amount of time they want to spend on something, estimate how long they can be attentive to the activity, and then plan for breaks accordingly (Rappaport, n.d).

Molly and her classmates had a big project due on *Charlotte's Web* at the end of the week. Each student was supposed to make a scrapbook to show the main themes of the novel. Molly was unsure when the project was due, so she just chipped away at it slowly. Throughout the week, she noticed that most of her classmates were putting the finishing touches on their scrapbooks whereas she was still gathering pictures, picking a theme, and making the front cover of her scrapbook look pretty. Molly was supposed to be working on this project for homework every night, but instead, she was reading *Diary of a Wimpy Kid*, playing soccer, and watching TV. When it was finally the end of the week, Molly was rushing to finish her scrapbook. It was nowhere near done when she handed it in.

Throughout the excerpt, Molly struggled with her executive functions of goal setting, planning, prioritizing, and time management. Molly did not set attainable goals for completing her project on time. She did not plan *how* she would complete her project, what steps she would take, or

what order she would work on the project. She did not prioritize what parts of the project she should do first, and she did not manage her time well. What strategies could have supported Molly in this project and with her executive functions: planning, prioritizing, goal-directed persistence, and time management?

The first strategy is straightforward, it involves teaching students the importance of setting goals. Forgan and Richey explain that “when we create goals, it provides a focus. If we know where we’re going, then we can formulate a plan of action to get there, using a logical progression of steps” (Forgan & Richey, 2015, 193). Goals provide us with the motivation to start a task and to keep going. Goals let us know that there is a purpose to the work that we are doing. We need to have an open conversation with students about goals; share some of your goals with the class and allow them to share some of their own goals. Point out to students that if they want to be a doctor, or a chef, or a businessman when they are older, then they need to first work hard in school. Students need to go through school to learn life skills so that they can one day be college and career ready. Simply bringing awareness to goals will remind students that there is a purpose to the work that they are doing.

Molly could have been more successful if her teacher had emphasized the goal of the scrapbook assignment. Molly’s goal was to complete her scrapbook by the end of the week. With that being said, the teacher could have sat down with Molly, addressed this goal, and explained to her why doing this assignment was important— it would enhance her comprehension of the novel, strengthen her writing and reading skills, and augment her vocabulary. This assignment would also be a nice accomplishment because it shows how much Molly learned from *Charlotte’s Web*— a

book Molly loved reading. Bringing awareness to the purpose of an assignment and setting a goal, no matter how small, motivates students to stay on track and complete a task.

To achieve our goal, we must plan the route to that goal. Dwight D. Eisenhower declared that “plans are worthless, but planning is everything.” Honos-Webb explains that “this means that without a plan, all our goals are wishful thinking. Without planning, we’re unlikely to get past our first step. . . Advanced thinking, prioritization, and planning for mishaps are all part of the mental prep work for planning a clear path to your goal” (Honos-Webb, 2018, 46). Forgan and Richey suggest using the following system for planning the completion of a projection or another assignment:

- 1.) Identify the due date
- 2.) Break the project into smaller sections or tasks. Write them.
- 3.) Estimate the time requirements for each. Write them.
- 4.) Set due dates for each section. Write them.
- 5.) Begin. Cross off each area as completed. (Forgan & Richey, 2015, 199).

This system could be put in place through a meeting with the student. Whenever there is a big assignment, the teacher could meet with a student and provide them with an explicit graphic organizer that spells out everything that needs to be done. The teacher could ask the students how long they think different aspects of the task will take and they can make estimates and pick due dates for smaller tasks together. This brings awareness to the concepts of planning, prioritizing, and managing one’s time. The teacher could then check-in with the student’s progress as they work on the project. If the students marks off something as completed on the graphic organizer, then the teacher could review that task and sign that aspect of the graphic organizer if she feels that the

student has completed this task correctly. This strategy provides a balance between student ownership and structured support. If Molly's teacher had done this approach and broken down the assignment into smaller tasks to be completed throughout the week, then Molly would have stayed on track and she would have been held accountable in finishing the project. Checklists are something that both 1st-grade teacher, Ms. O, and 3rd-grade teacher, Ms. E, incorporate in their classroom. Both of these teachers created checklists of expected behaviors for their struggling students. They then laminated these checklists so that students could tape them to their desks and use an expo marker to check off each expectation that they are meeting. Laminating the checklist was a great idea because it allowed the student to use it daily.

Another way to promote planning is by playing the "step game." The step game involves planning a pretend outing with your student and going through all of the steps that it would take to complete that outing (Forgan & Richey, 2015, 199). This could be done with the whole class or individually with the student who struggles to plan. For example, the teacher could say: "If we are going on a class field trip to the museum, what are the steps that we would need to take in making this field trip possible. For example, what would we pack? How would we get there? Who would come?" Together, the teacher and the student could then make an ordered list of things that need to get done so that this field trip could be possible. Not only does this encourage planning, but this step game also encourages problem-solving skills. The step game can be played daily, weekly, or once in a while with students; however, the more awareness you bring to planning the better.

Forgan and Richey explain that cooking helps students plan. They remark that cooking, "requires reading a recipe, gathering the proper tools and ingredients, putting them together in the right order, cooking the food at the correct temperature, and remembering to take it out when it's

done. The point isn't to make perfect cookies. It's to get practice envisioning and executing a plan" (Forgan & Richey, 2015, 201). Although it is not always possible to cook in a school, one could always suggest this as homework to parents, or they could simply talk through baking cookies and write the steps to execute this plan— just as they did with the step game.

Explicitly teaching how to use a planner or calendar is crucial to promote better time management skills. A planner or "homework notebook" is a school supply that teachers should require for not just students who struggle with executive functions, but all students. Branstetter declares that "the first step in helping your child manage his time is to teach him how to use an individual planner to keep track of homework, deadlines, tests, and other commitments" (Branstetter, 2014, 111). A planner allows for your students to visually see all that they need to accomplish that week. This helps them plan accordingly. To promote time management, a teacher can discuss with the student about how long she anticipates tasks to take. For example, if the student has written down "math problems 1-13" in their planner, then the teacher could say: "I think that math homework might take you half an hour, so make sure you plan accordingly tonight;" or the teacher could ask the struggling student: "How long do you think it will take you to complete the math homework tonight?" This conversation brings awareness to thinking about time, planning, and managing one's time.

Another strategy to promote time management is teaching about prioritizing. Give a student a list of activities: playing video games, doing homework, doing their chores, eating dinner, brushing their teeth, and playing with their friends— then ask the student what task *has* to be completed that day. Have the student rank the activities from most important to least important or from what needs to be completed first to what can be completed last. Additionally, ask the student



why they need to complete tasks like homework, before they can play video games. Students need to understand that if they don't do their homework or if they don't do their chores that there will be consequences which is why it is important to prioritize completing these tasks first. We need to teach students that it is important to have time to relax and have fun, but that work needs to get done first.

## Task Initiation

Task initiation includes the abilities to: independently start new activities, be daring and spontaneous in conversation, begin activities without procrastination, discover new information, problem-solve, and persevere to complete different activities (McCalla, 2013). Students who have task initiation challenges will be more likely to forget their homework, cannot start new tasks or generate new ideas, and typically struggle to make decisions (Gendron, n.d.).

Molly and her classmates were in the library choosing independent reading books. The teacher instructed the students to pick out a book and then write down the title, author, and why they chose the book. Molly was wandering up and down each aisle. She picked up book after book. She looked at the pictures on the cover, she read the first page, and then she would put the book back. Molly just couldn't decide what she wanted to read. All of her classmates had already picked their books and were sitting at their desks, starting to fill out their paperwork.

“Molly, please hurry up and choose a book,” her teacher called.

*I just don't know which one to choose! What if I choose one and I hate it? Also, the more I walk around in the library, the more time I'm away from doing classwork. . . Alright, let me go back and look at the first two books I picked up. . . then I'll decide which one I want to read.*

This passage shows how Molly struggled with her executive function of task initiation.

Molly had a hard time picking out a book and starting the task. Molly wanted to procrastinate starting the task by wandering around the library for longer. Previously, we just talked about how we set goals, plan, prioritize, and manage our time to complete a task— now it is time to talk about how we can get a child to *start* a task.

The first strategy to accommodate students who struggle with task initiation is to set expectations and boundaries. If a student struggles with starting a task, then motivate them through using the Premack Principle. Branstetter defines the premack principle as, “a social-psychology theory that suggests that people are motivated to complete an undesirable task in order to do a desired task” (Branstetter, 2014, 76). For example, if Molly’s class had recess right after they had library, then the teacher could say to Molly that: first she must complete the task of choosing her independent reading book and filling out the information on it before she can join her class outside at recess. This would motivate Molly to not only start the task, but to complete it! Some students will have a difficult time with this and will argue to complete the desired task (such as going out to recess) first, but that is when you encourage students by saying; “Imagine how happy you will be when this assignment is done and you can run around outside and join your friends without having to think about this” (Branstetter, 2014, 76). This act of encouragement will provide extra motivation for the students who have a hard time visualizing the completion of a task. 1st-grade teacher, Ms. O, implements this strategy in her classroom. She explained that every day she does reading centers and that one of the centers is a paper work center and another is the iPad center. In her classroom, if

you do not finish your paperwork, then you cannot move onto the iPad station until it is completed. She has found this to be really motivating for her students because they love that iPad time.

Another motivating force to start and complete a task is the power of choice. Branstetter explains that often children simply don't know where to start on an assignment and simply encouraging a student to choose *where* they want to start will suddenly make them a lot more motivated. She continues by suggesting that teachers: sit with the child and discuss which parts of the assignment seem "easier" and which parts seem "harder." After this discussion, the teacher should encourage the student to choose the part of the assignment that seems like the smallest and easiest task (Branstetter, 2014, 77). As Honos-Webb explains, starting a task is the hardest part, but once you get started it's easier to keep going (Honos-Webb, 2018, 53). Honos-Webb continues by explaining that "one secret to getting moving is to start small by breaking the task down into smaller components or making a short time commitment just to get the ball rolling" (Honos-Webb, 2018, 53). Molly's task was a bit overwhelming because she had no clue what type of book she wanted to read. If Molly had simply taken the first, *small* step of deciding what kind of book she wanted to read, then choosing a book would have been a lot easier. This power of choice can also be applied to homework or math stations. The students still have to complete each assignment, but allowing them to choose where they want to start is motivating because it gives them a sense of power over their work and makes them more compelled to start.

Just like many of the other executive functions discussed, using praise, positive behavior reinforcement, and rewards are very encouraging to motivate students to start a task and to avoid procrastinating. Additionally, encouraging students to set goals for the assignment will help them see a purpose in their work (Branstetter, 2014, 77). Lastly, if the teacher encourages the time

management and planning strategies of creating a schedule and sticking to it, then the assignment will seem a lot less intimidating. The goal will be in sight and it will be easier to get started.

## Organization

In a school setting, organizational skills can be seen through the complex strategies of breaking down one task into manageable parts, slowing down, focusing one's thoughts, and keeping track of personal effects (tools or materials that you are using in an activity) (Gendron, n.d). The backbone of organization is the ability to be efficient. Students who struggle with organization typically do not keep track of their materials, misplace belongings, bring the wrong materials to class, have messy workspaces, and struggle with properly communicating their thoughts (Gendron, n.d).

Molly's class had been working on a science project on volcanoes. Seeing as Molly loved science, she spent hours upon hours perfecting her project at home. On the day that is what due, Molly was rushing around her house to get ready.

"Molly, hurry up! You're going to miss the bus!" her mother called.

Molly quickly brushed her teeth as she simultaneously jumped up and down to get her left sneaker on. She swiped a brush through her hair, swung her backpack on, and dashed through the door.

"Bye Mom!"

"Molly!"

Molly swung back around.

"You forgot your project!"

"Whoops!" Molly ran back, grabbed her project, and ran to the bus stop.

\* \* \* \* \*

When the bus arrived at school, Molly bounced out of her seat and headed out the door.

“Molly!” Timmy called, “You forgot your project. It fell under the seat.”

“Whoops!” Molly ran back, crawled under the seat and retrieved her poster.

\*       \*       \*       \*       \*

When Molly finally got to her classroom, she shoved her project in her desk.

\*       \*       \*       \*       \*

At the end of the day, Molly’s teacher told the class that she would have their projects graded and hand them back at the end of the week. She thanked them for turning them in at the beginning of the class.

“*Uh, oh,*” Molly thought.

Molly searched her desk for the project. She took out her independent reading book, her crumpled up math worksheet, her plastic water bottle, her agenda, her toolbox, her old project on dinosaurs, her ruler, her crumpled up goldfish snack wrapper, and there it finally was— her project.

“Sorry, I forgot to pass this in earlier!” Molly said as she handed her project to her teacher.

Throughout this passage, Molly struggled with her executive function of organization. Molly failed to remember that she needed to turn in her project that day. She did not remember where she placed her project— twice. Furthermore, she forgot to hand in her project on time and had to search (last minute) through her disorganized desk to find it. Throughout this scenario, Molly exemplified every quality that Forgan and Richey, as well as clinical psychologist, Dr. Marie-Josée Gendron Ph.D., C.Psych., describe: students who struggle with their organizational skills often have cluttered workspaces, cannot locate materials, have messy backpacks, and fail to turn in completed homework for credit (Forgan & Richey, 2015, 122).

Organizational skills go hand-in-hand with planning and prioritizing. According to Branstetter, “planners are useful for keeping track of what is due, what is on deck, and what other

activities may take up time each day” (Branstetter, 2014, 178). Planners or agendas can help students organize their schedules, their homework, and upcoming due dates. It helps them think ahead as they organize how their day, week, and month will play out. However, planners are only helpful if students frequently check them (Branstetter, 2014, 179). If Molly had been in the habit of checking a planner, she would have been aware that her project was due that day. Furthermore, she would have been more likely to check for her project before she walked out the door. As previously mentioned, teachers can provide check-ins with students to promote the use of a planner and instill the habit of writing down homework. Teachers can check daily to see whether the student has written down their homework and if they have written it down then, they can receive a sticker. Every time they reach ten or twenty stickers, they can be rewarded because this will extrinsically motivate them to continue the behavior of writing down and checking their homework. The teacher can also increase the number of stickers needed before receiving a reward as the year goes on. The goal, therefore, is to continually shift the skill to be more demanding until the student has internalized the desired behavior.

This sticker method could also be used to promote an organized desk. The teacher should set up a time to meet with the struggling child to help them organize their desk. Forgan and Richey suggest drawing a map with the student (for example a picture of the desk including each drawer/shelf) and drawing out where everything will go (Forgan & Richey, 2015, 129). The teacher and the student can then use the map to organize the physical objects in the desk. The student can also keep this map as a “key” to organizing their desk. At the end of each day, the teacher could check to see if the student’s desk is organized according to the key and if it is, then they will receive a sticker or some other form of a token. Once the student has collected a predetermined number of

stickers (such as ten), then they will receive a reward. As mentioned before, this will motivate the student to continue this behavior (as long as the reward is something of interest to them). The teacher might consider providing this support for all students initially and then phasing it out for those who no longer need it as the year progresses.

Branstetter suggests teaching the motto, “everything has a home” (Branstetter, 2014, 172). For example, when helping a student organize their desk, the teacher would explain that each book has a home, that each pencil has a home, and that even each goldfish wrapper has a home (which would be the trash). As an alternative to drawing a map of the desk, Branstetter suggests taking pictures of where each item goes to provide visual reminders of where each objects’ “home” is to your student (Branstetter, 2014, 173). This could be on a poster affixed to the wall for all students to reference. Branstetter also suggests setting aside a time to “declutter” (Branstetter, 2014, 173). If the teacher is checking on a student’s desk at the end of each day, it could be a good idea to set aside five minutes in the afternoon for the students to declutter, reorganize, and throw away any trash that might be hiding in their desk. This will encourage the habit of decluttering and support a successful start to the next day.

Forgan and Richey suggest making this decluttering a whole class activity rather than just the disorganized child. They explain that “it helps to look around and see how their friends manage their possessions, because there's more than one way to be organized” (Forgan & Richey, 2015, 132). They also suggest having students work with peers to clean out their desks because “this may help the weaker child process why certain things are kept, why others are discarded and how to manage his belongings” (Forgan & Richey, 2015, 132). 2nd-grade teacher, Ms. R, proclaims that, “a clean desk is a clean mind.” She has her students clean out their desks every two to three weeks.

Ms. R allows the students to work with partners because she thinks that “it makes it fun for the kids.” Ms. R took it one step further by including herself and decluttering her entire classroom. She suggests that one should always, “take a good look at themselves as an educator.” Ms. R believes that decluttering her classroom was incredibly beneficial because it limited distractions. She explained, “I want a warm and welcoming learning space, but I don’t want to overwhelm students with too much stuff.” Whether you decide to have this activity be whole group, partner work, or individual, decluttering is an important routine that should be established to help the disorganized child.

With decluttering, Forgan and Richey remark that students can learn from their peers when they see how other students manage their belongings. Both 3rd-grade teacher Ms. E and 2nd-grade teacher Ms. R also agree that students can learn a lot from their peers— and not just with decluttering. Both Ms. R and Ms. E practice flexible seating and thoughtful grouping. Ms. E explains that she deliberately groups and pairs students who struggle with their executive functions with students who are more mature in that area. She believes that this strategy is beneficial because sometimes students learn better from their peers.

Color-coding binders, folders, and notebooks are a great way to stay organized. For example, encourage a student to designate one color for each subject. If a child has a green notebook, binder, folder, and book cover for science, then it will be a lot easier for your student to keep track of what they need to bring to school and what they need to take home when they have science homework. Branstetter remarks that a child “will begin to associate a color with a subject, (e.g., math is blue) and at the end of the school day, he can grab all the blue items if he has a math test the next day” (Branstetter, 2014, 175). This reduces the likelihood of a student grabbing the



wrong materials or forgetting the needed materials. Additionally, the teacher could learn the student's color-coding system. If the teacher was planning on giving a math test the next day, she could then say; "Molly take all of your blue materials home tonight to study."

To develop an organized homework system, a teacher could encourage a student to create a "do-done folder." This is a system that designates one side of a folder to be labeled as "done work." This side of the folder indicates work that should be brought home and that should stay home because it is completed. The other side of the folder will be labeled as "do." The "do" side lets students know what homework they need to accomplish that night and what should be brought back to school completed the next day (Branstetter, 2014, 176). Special education teacher, Ms. J, uses a similar strategy in her classroom. She explains that she has a filing system where students have a "take-home" folder and a "progress" folder. This system will help students keep track of what needs to be done and it will lessen the chances of assignments getting lost. It also supports parents as they check-in with their child about homework that needs to be completed. The teacher can check-in with the student throughout the day or at the end of the day, to ensure that the student is storing the assignments on the proper side of the folder.

To help promote organizational skills, Forgan and Richey suggest providing the student with a classroom organizational responsibility. For example, give a student the "job" of organizing the bookshelf each day. This job will "get them in the habit of putting things back in the same place every time" (Forgan & Richey, 2015, 128). Additionally, a job will be motivating to the student, it will hold them accountable, and it will promote the habit that you are trying to foster. However, teaching students strategies to be organized is not enough, teachers must continue to frequently check-in with students, track progress, and reward positive behaviors to be reinforced.

## Response Inhibition

Response inhibition, or “behavior inhibition,” can be defined as “the suppression of actions that are no longer required or are inappropriate, which supports flexible and goal-directed behavior in ever-changing environments” (Verbruggen, 2008). Response inhibition is a crucial component of executive functions that works closely with self-regulation to help students pay attention and act appropriately in a variety of different situations and activities (Friend, 2018, 169). In other words, response inhibition is regulating and controlling impulses and behaviors (Verbruggen, 2008). Students who struggle with response inhibition may be more prone to blurt-out in class or hit others when they are upset. Unfortunately, such problems may affect more than a students’ academic success, it may also affect one’s ability to socialize and develop friendships with peers (Rosen, n.d.).

Molly and the rest of the class were finally presenting their volcano projects. Molly was jumping up and down. She couldn’t wait to show her project to her classmates.

“Can I share mine first? Can I share mine first?” Molly screamed across the classroom, as she ran up to her teacher and tugged on her dress.

“Molly, please go back to your seat and I will let you know when it is your turn to go.”

Molly ran back to her seat but didn’t sit down. Instead, she went to the corner table, sat at a spinny chair and spun around as fast as she could.

“My project is going to be the best!” Molly sang to her classmates.

“Alright, so I am going to tell you the order of when you are going to present—”

“Can I please go first! Please?”

“Jayden is going to go first.”

“Are you serious?” Molly threw her project on the ground.

Throughout this passage, Molly struggled with her executive function of response inhibition. Molly was frequently interrupting, blurting things out, and moving around the classroom. She wanted to present *immediately* and created a disruption when this desire was not met. These are clear signs of someone who struggles with their response inhibition. Other possible behavior signals (that Molly could have demonstrated) include students who: say things without thinking, engage in name-calling, demonstrate frequent meltdowns, frustrate easily, hit others impulsively, break things, and run when upset (Forgan & Richey, 2015, 38). Emotional control is closely tied to response inhibition because response inhibition refers to the control of one’s instincts.

When teaching students strategies for impulse control, metacognition or “thinking about thinking,” and mindfulness practices resurface. Honos-Webb explains how “metacognition enables you to observe your own thought process in flight and such critical perspective leads to better decision making. If reactivity [reacting impulsively and emotionally] is a form of mindlessness, mindfulness is a part of a solution to strengthen your ability to think about and evaluate your own thinking” (Honos-Webb, 2018, 110). As I mentioned before in the emotional control and sustained attention sections, teaching students to take deep breaths and relax with yoga and meditation can be beneficial in slowing down their thoughts which will slow down their impulses.

Forgan and Richey explain that playing games is beneficial in teaching students to control their impulses. They explain that:

Popular children's games also can be a big help teaching younger children the ability to stop, wait, or follow instructions. Think of Red Light, Green Light. The goal of the game is to be the first to cross the finish line, but you're called out if you move on the red light. The child with impulse control challenges will have to work harder to stop at the proper times, but it's great practice (Forgan & Richey, 2015, 44).

Researchers at Harvard University conducted a study on the use of games to promote improved executive functions. For example, they suggest that card games such as *hearts*, *spades*, and *bridges*, help promote executive function skills by having students track playing cards. They explain how such exercises develop working memory and promote mental flexibility, (In Brief: Executive Function, 2012). Harvard researchers also explain how "games that require fast responses and monitoring are also great for challenging attention and inhibition. *Snap* and *Slap Jack* are card games that fall into this category. [The game] *Perfection* draws on similar skills" (In Brief: Executive Function, 2012). Games, in general, encourage response inhibition and emotional control because children will quickly learn that others will not want to play with them if they destroy a game or are not good losers.

Forgan and Richey also encourage setting up a consistent routine with high expectations. They highlight "when kids know what to expect, there is less chaos and less opportunity for impulsivity" (Forgan & Richey, 2015, 44). A teacher should set a consistent routine and high expectations for the entire class. Additionally, one must reinforce expectations through rewards and punishments because if there are no consequences, then students will not abide by the rules. For example, if the teacher had set up high expectations and consequences for raising one's hand and waiting to be called on, then Molly would have been less likely to repeatedly call out. When the

student does wait to be called on successfully, it is important to praise and thank them for their patience (Forgan & Richey, 2015, 46). As mentioned before, routines may be interrupted which can lead to a student acting out. If you know as a teacher that there is going to be a class assembly where a student will need to practice a lot of self-control, then create a mutually agreed upon plan ahead of time and set up a reward for each segment of the assembly. For example, the student receives one star for every five minutes she sits quietly and listens during the assembly. This type of positive reinforcement breeds motivation by providing attainable expectations.

Branstetter encourages teachers to anticipate students' triggers. She explains that students who act impulsively often provide warning signs before they act and that it is our job as teachers to look out for these warning signs and then redirect, prompt, or remove that child from the situation (Branstetter 89). For example, if the teacher knew that Molly was really excited about sharing her project and that she would keep shouting out and getting upset if she didn't share first, then the teacher should have either let Molly go first— or encouraged her to take a walk, get a drink, and take a deep breath while she waited for her turn. Another example would be a student getting frustrated while doing a math problem. If the teacher notices that a student is gripping their pencil hard, clenching their teeth, and bouncing their legs up and down— then they should ask the student how they are doing, if they need help, or if they need a minute to breathe. Looking and acting on these warning signs will limit meltdowns and help regulate impulsive behaviors.

Another important strategy is teaching replacement behaviors. Branstetter provides examples of teaching a student to say “excuse me” in a conversation or holding up a finger when they want to add something (Branstetter, 2014, 90). She remarks that by teaching these tools we can ignore behaviors that we don't want and redirect the students to do behaviors we do want.

Additionally, she explains that even though teaching “excuse me” seems obvious; “Sometimes what seems obvious to an adult has to be explicitly taught to a child with impulsivity” (Branstetter, 2014, 90). This is a tip that should be kept in mind for all executive function strategies. For example, most people can understand that when they can’t find materials repeatedly in a messy desk. . . that they should probably reorganize their desk and find a better system. However, this realization is not always so obvious or so easy to accomplish for students who have executive function challenges which is why as teachers it is our role to be as supportive and helpful as possible.

Students who struggle with impulsivity often make careless errors when doing their work because they rush through it and often do not check their answers. Branstetter suggests two strategies to promote students to check over their work. The first strategy can be used for math word problems. It directs to:

- 1.) Read the entire problem out loud.
- 2.) Draw a picture of the problem.
- 3.) Circle the keywords for clues about the math operation (e.g., *more than, less than, fewer, equal to, how many left?*).
- 4.) Set up the problem.
- 5.) Do the problem.
- 6.) Check your work. Does your answer make sense? (Branstetter, 2014, 92).

Not only does this strategy promote checking one’s work, but it also slows down the process of completing the math problem. It prevents students from just quickly looking at the problem and impulsively writing down an answer. It provides them with a sequence of steps that sets them up for success. This sequence of steps could be outlined on an anchor chart or a poster displayed

throughout the classroom. When we use anchor charts and posters to display problem-solving strategies, it helps not only the student who rushes through the problem but also the student who struggles with working memory and has a hard time remembering the steps to completing the problem. 2nd-grade teacher, Ms. R, displays anchor charts and posters all throughout her classroom. She explained that her students writing and math skills have improved “overtly” and “consistently” after she implemented this anchor chart strategy.

The second strategy is called “COPS” and is a tool used to help students with their writing.

COPS stands for:

1. **Capitulation:** Check that the first word in each sentence and proper nouns are capitalized
2. **Overall:** How is the overall appearance and readability (spacing, legibility, indentation of paragraphs, neatness, complete sentences)?
3. **Punctuation:** Is the punctuation correct? Do sentences have periods? Do questions have question marks?
4. **Spelling:** Is the spelling correct? (Branstetter, 2014, 92).

This strategy once again slows down the process for the student. It promotes self-reflection and reviewing one’s work. These steps will help to reduce your impulsive student’s silly mistakes.

Lastly, one strategy that is imperative for students with executive function challenges is to “catch them when they are good.” Forgan and Richey remark that: “Students with impulse control issues often feel like bad guys, because their behavior so often lands them in trouble with you . . . Even if you don’t like their behavior, find ways to let them know that you’re on their side” (Forgan & Richey, 2015, 50). Branstetter echoes this when she explains that: “students with response-inhibition difficulties are often stuck in negative-feedback cycle;” she elaborates that,

“One way to counter this is to be on the lookout for desired behaviors. Whenever you see your child waiting patiently, be sure to comment on how much you appreciate her patience” (Branstetter, 2014, 91). Praise reinforces the desired positive behaviors, it boosts students’ self-esteem, and it makes them feel supported. As mentioned before, teachers should strive to meet that 5:1 (praise to criticism) ratio to promote a positive classroom environment and positive teacher-student relationships.

## **Interview Findings:**

The sample of practicing teachers that I referenced throughout this thesis was gathered from a convenience sample. Some were my pre-practicum supervising practitioners during my teacher preparation and others were teachers I met while subbing as a paraprofessional. Others were either my former elementary school teacher, a friend, or a relative. The teachers that I interviewed ranged from the grades: kindergarten to 3rd grade. Ideally, I would have liked to interview a fourth and fifth-grade teacher, but I was not able to find a participant from these grades. If I had interviewed a few fourth and fifth-grade teachers, I may have found different examples or challenges. Overall, I faced some obstacles finding willing participants. In the end, four participants agreed to answer initial questions via email and then have follow-up phone calls while the other two agreed to face-to-face interviews.

After interviewing six elementary school teachers and comparing their responses, I discovered that the executive functions that these teachers were the most familiar with consisted of self-regulation, sustained attention, organization, time management, task initiation, working memory, and planning/prioritizing. None of the teachers mentioned goal-directed persistence, mental flexibility, response inhibition, or emotional control. Five out of the six teachers interviewed



mentioned self-regulation and sustained attention as the executive functions that they are most familiar with and that they see students struggle with the most in their classroom. Organization was then mentioned three times, time management and task initiation was mentioned twice, and planning/prioritizing, as well as working memory, was mentioned once. One teacher mentioned that goal-directed persistence was seen as a higher-level skill. Another teacher mentioned that struggles with self-regulation is something that can be seen all across primary grades. This makes me wonder if I had interviewed fourth and fifth-grade teachers if they would have been familiar with different executive functions. Would they have been the most familiar with goal-directed persistence and mental flexibility? Are those higher-level skills? Would self-regulation have been mastered by those upper elementary grades?

One thing that I found the most interesting in my interviews was the fact that no one specifically mentioned the executive functions: emotional control or response inhibition. The only time that coping mechanisms and social skills were discussed was when talking with the special education teacher. Today, there has been a push to create social and emotional standards for teachers to follow. Social and emotional education seems to be up and coming, so it was interesting to me that there was little to no remarks on this aspect of learning. Is it because teachers *don't* focus on these areas? Is it because teachers don't feel comfortable talking about or teaching these areas yet because they do not have standards to teach from? Perhaps, it is simply that the teachers think of both emotional control and response inhibition in terms of self-regulation. Sometimes, emotional control can be referred to as self-regulation, so this is not wrong or a problem for teachers to think this way; however, none of the teachers mentioned emotions when discussing self-regulation. These teachers talked more about the organizational or behavioral aspects of self-regulation. The

behavioral aspect of self-regulation deals with impulsivity which is why I think teachers overlook response inhibition as its own category.

The oversight of response inhibition makes me concerned that teachers might not address emotional control in their classrooms. The only time that strategies for dealing with emotions were brought up in conversation was with the special education teacher. We live in a world with inclusive classrooms and teachers often have students who experience trauma, or aggression, or depression. These teachers must be equipped with strategies to support all students. Since children vary in the level of home support they receive, it is essential that school supports the emotional development of students.

Another commonality in the interview data was the finding that most teachers said their students were “too young to diagnose” with executive function challenges. Repeatedly I heard things like: “You wonder if it is just the age;” “I let it go at the beginning of the year because they are still so young;” “I think it is all primary students in general.” This led me to wonder: *Is it just the age?* I can understand what these teachers are saying and I can sympathize with the idea of not wanting to diagnose, but then it makes me wonder: *When do we diagnose?* My interviews left me conflicted because all of the first and second-grade teachers shared these ideals of “it’s usually just the age; it’s hard to diagnose,” but then the one third-grade teacher explained how typically when the student gets to her they already have a 504 plan for executive functioning disorder. This left me to ponder the question: *When should struggles be considered more a lack of maturity? Where do we draw the line from “it’s just the age” to “this is a problem”?* Once again, this led me to wonder how fourth and fifth-grade teachers experience student challenges with executive function. Would they say the same thing? Would it still, “just be the age”?

The interview data also revealed that teachers found it hard to collect concrete data on improvement in executive functions. After asking teachers what strategies they used to accommodate students with executive functioning challenges, I asked: Do you think these strategies were successful? How did you measure or collect data to see if the strategies you used were working? Time and time again I was met with responses like, “these strategies were successful” without concrete measurable evidence to back it up. Teachers seemed to base progress on what they saw and felt. In other words, the teachers used anecdotal evidence to determine what worked. After taking a course on classroom management centered on positive behavior intervention and supports (PBIS), I wonder if using more concrete data collection and analysis might be a useful addition to supporting executive function challenges.

Only two out of the six teachers received professional development on executive functions. Additionally, both of these professional development courses were optional. Why is this the case? One teacher mentioned that she has known about the term executive function for around ten years but it is not a focus in the district. Lastly, the interviews highlighted how much teachers rely on the support of others to accommodate executive functions. Almost all of the teachers mentioned that they collaborated with staff such as occupational therapists, speech teachers, psychologists, ABA specialists, and assistant principals to provide appropriate support. This reliance led me to consider the idea that perhaps teachers did not feel it was their primary responsibility to support executive function challenges, but rather it was the goal of other support personnel.

## Conclusions:

My recommendations include mandatory professional development for all elementary school teachers on accommodating executive function challenges. I think it is great that teachers collaborate with support personnel in their buildings; however, teachers must gain fluency in supporting executive function challenges due to the breadth of the problem. The general education teacher often has the closest and most supportive relationship with students - perhaps better than the behavior specialist, speech and language specialist, school counselor, or school psychologist. With that being said, I believe that the ABA (and other staff) typically provide *general* research-based strategies in accommodating the struggling students, but if the general education teacher is informed on executive functions, then they can implement *personal* strategies that may best support the student. Overall, the goal is to move away from the *dependence* on the guidance of specialists and to move towards a *partnership* between the general education teacher and the specialists. Ultimately, the teachers should be the ones who implement the intervention strategies, but ideally they will still be able to call on specialists for observations and interventions if needed.

Additionally, I believe emotional control strategies should be explicitly taught in classrooms. There is a current push for social and emotional standards to be implemented in the Massachusetts Curriculum Frameworks. Updates on these standards can be found through the Massachusetts Department of Elementary and Secondary Education's website. The website informs that "in April of 2016, the Board of Elementary and Secondary Education (BESE) held a special meeting on Social and Emotional Learning to provide an opportunity for members to hear a number of key ideas, information, and examples from experts in research, policy, and practice, and have the

opportunity to discuss the topic of SEL” (Massachusetts Department of Elementary and Secondary Education, 2019). Additionally, the website outlines that they have begun an:

introduction to Social and Emotional Learning in Massachusetts Public Schools.

The Department commonly uses the Collaborative for Academic, Social, and Emotional Learning (CASEL's), definition of Social and Emotional Learning (SEL): *SEL is the process of developing students' and adults' social and emotional competencies—the knowledge, skills, attitudes, and behaviors that individuals need to make successful choices*” (Massachusetts Department of Elementary and Secondary Education, 2019).

This word “introduction” shows that SEL learning is still in the beginning stages; however, it is the direction that education is headed towards. With that being said, I support this push for SEL learning. I think that emotional control is something that should be taught to the entire class, not just struggling students because often it is hard to tell when students are struggling emotionally if they don't erupt with anger

Lastly, I believe teachers would benefit from an evidence-based chart that shows developmental milestones for elementary age children in relation to executive functioning skills. The teachers in this study mentioned that “it was just the age,” which could mean students who struggle with executive functions do not get the needed support and intervention. Furthermore, I support the integration of observable data collection and analysis. We should not just base success off of our own judgments. In order to meet the needs of today's elementary students, all general education teachers must receive professional development centered on supporting students with executive function challenges. This preparation should include exposure to developmental

expectations, data collection mechanisms, and analysis support. When this day comes, maybe the classroom will finally “feel like magic” for all children.

**What more would you like to know about executive functions?  
What do you think would be most helpful in supporting  
students in your classroom with executive function challenges?**

“District Wide Professional Development opportunities would be beneficial for staff to learn more about executive functioning”—1st through 3rd-grade special education teacher, Ms. J

“In a perfect world, a full-time aide in every classroom would be instrumental in helping students find strategies to increase executive function”— assistant principal and kindergarten teacher, Ms. B.

“I would love to be equipped with more concrete strategies for supporting students with executive function difficulties. Professional development in this area would be helpful, for sure!”— 1st-grade teacher, Ms. G.

“I would opt for professional development in this area. I would want to know if there’s a concrete rubric (for classroom teachers) for determining what is officially an “executive function deficit.” Instinctively, a seasoned teacher will make adjustments and accommodations, even without an official accommodation plan, if a student is struggling. As a teacher, you need to be flexible to all

needs and learning styles, but not overlook a potential deficit that could impact a child's ability to learn"— 2nd-grade teacher, Ms. R.

"I would like to know more tips and tricks that I can pull out of my own back pocket. Every teacher has their own *Mary Poppins bag*, so I would like professional development that supplied me with more things to stuff in there, so that if a student arises in the next few years that has something new, I will have some sort of prior knowledge to help them"— 3rd-grade teacher, Ms. E

"I would love to have access to and read more current things on executive functions"— 1st-grade teacher, Ms. O

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