Binders as a Fundamental Organizational Tactic For Students with Autism Spectrum Disorder

Abstract

Though academia has adapted over time to support the modern student better, its foundation has consistently aimed to support all types of students with intentional, targeted material. Much of the modern curriculum is geared toward meeting as many student needs at a time, which is an ideal practice in theory but much more difficult to implement long-term. Some students, like those with autism, require a more direct level of support and resources to account for their complex needs. There are quite a few tactics that academic professionals may consider implementing to provide the best possible support for these students, though those tactics must all function as one unit to maintain consistent progress. Binders function as a vehicle for students with autism to be accountable in their progression through a creative and engaged lens. This paper aims to explore both the short- and long-term impacts of binders as a necessary facet of the learning process and recommend best practices for these strategies moving forward.

Key Words: *students with autism, organizational tactics, binders, active learning, executive functioning, typically developing*

Chapter 1

Introduction

Academia is primarily rooted in providing necessary resources and support to best meet student needs. Considering that many students require a variety of supports to prosper academically, it follows that the tactics would differ per student. The best practices are fluid and can therefore adapt with the student over time to reflect on their skills and experiences. Supporting students with autism is an entirely different entity because of the multi-faceted nature of autism and the legally required support those students need for an equitable academic experience. There are a few ways in which educators and support staff can provide the tools for students with autism to succeed, and implementing those practices takes time for the student to adjust to so that they can effectively benefit from the strategies. Perhaps one of the most challenging skills for students with autism to master is the concept of time management and organization of content. Enforcing a binder system in which the student is encouraged to take an active role in their learning autonomously is one of the most effective methods of teaching organizational skills over time. Including binder maintenance into their schedules inspires independence, structure, and critical thinking that can only benefit the student long-term and consequently apply those skills to other facets of their lives.

Background of Study

Historically, academic professionals have modified their approaches to meeting student needs by considering relevant cultures, interests, and skills. Binders have been used consistently in education because of the innate ability to encourage student mastery of content while developing relevant life skills. Fluency-based instruction highlights how students with autism often need more time or support to finish the content, which puts them behind their peers (Weiss

et al., 2010)—incorporating a system that provides the structure for a student to autonomously work through content sets the expectation that they do not need as much direct support over time. Considering that students with autism often struggle with "fleeting attention, brief effort, and difficulties with sustaining responses" (Weiss et al., 2010, para. 4), it follows that they need a comprehensive foundation that supports their confidence in completing the work as well as allowing for the time to reflect their skills. Binders provide ample options for students to supplement their learning, both in academic and social terms. For example, a communication binder provides students with the tools to effectively express their needs with their peers through pictures and preset cards (Child's Communication Binder, 2021). Students with autism simply do not have the necessary executive functions to manage multiple or complex tasks at once, suggesting that the binders would essentially manage that need for them (Glickman, 2016). Though organized binders would not solve all of their concerns at once, they would undoubtedly make their day-to-day more manageable and provide resources that would help them positively develop over time. Through binders, the learner can effectively take charge of their learning process and “become more self-directed by encouraging the development of self-talk” (Glickman, 2016, para. 10).

Statement of Problem

Students with autism require personalized and long-term support to supplement their learning. Teachers apply a few different methods to personalize the curriculum for those students. Regardless, there must be a coherent system that prioritizes binder use for students with autism so they have the time to develop those necessary skills as a fundamental facet of their learning.

Purpose of Study

The purpose of this study will be to research the academic and reciprocal social engagement for students with autism at high school levels.

Audience

This study's audience is the professionals working intimately with students with autism each day and the administrators who create curricula for those students as a whole. Students with autism and their consequent teachers will benefit from this research as it pertains to their academic needs.

Significance of Study

This proposed research is necessary because it targets a specific need in the academic community. Educators and students must have access to updated best practices to ensure that their content is consistently efficient in meeting student needs, so this study will cover the gap between what the circumstances currently look like and what they could be per the application of best practices (Weiss et al., 2010). The impact of this study will revolve around the notion that districts that support students with autism must be aware of which facets of their curriculum they need to update to fund student success at all levels adequately. In having binders supplement their experiences, students with autism will prosper from more "engaging in varied academic tasks" as well as their general flexibility in content management (Weiss et al., 2010). Developing their executive functions is "critical to playing, organizing, and carrying out human behavior over long periods," which means that their binder systems also help them in other aspects of their life that largely contribute to their formed relationships over time (Glickman, 2016).

Research Question

How effective is keeping an organizational binder teaching organizational skills to high school students with autism?

Assumptions

- Teachers have extensive professional development in the targeted area
- The principal has allowed for research to occur
- The students' schedules will not be interrupted
- Students' guardians have consented to the research

Limitations

Many teachers handling learners with ASD have limited background and experience in effectively employing evidence-based assistive tools to enhance learning for these learners. Secondly, many schools have students from diverse backgrounds with diverse needs that may complicate the adoption of a uniform system or tool for all the students in an institution. Thirdly, the number of students in a classroom may limit the effective utilization of this tool; binders and other assistive tools are more suitable and productive in smaller classroom set-ups. Finally, the diversity of the student population entails the existence of divergent personalities and interests, which influences the uniformity in applying binders during the research and in practice.

Definition of Terms

Active Learning: The teaching and instructional delivery approach entails the teacher actively engaging the learners with instructional material through class discussions, role-playing, and problem-solving.

Autism spectrum disorder (ASD): A developmental disorder that negatively impacts communication and behavior. People with ASD typically experience difficulties interacting

socially with others and communicating, have restricted interests, and have repetitive behaviors. The symptoms of ASD inhibit the victim's ability to perform optimally in school, work, and other areas of life.

Binder: A usually detachable cover used to hold sheets of paper like magazine cuttings and photos.

Chapter 2

Review of Related Literature

The purpose of this chapter is to conduct a literature review on the use of binders as a teaching tool for autistic students to build organizational and executive functioning abilities. Through a review of the research, this chapter presents a theoretical framework that teachers may successfully refer to in order to facilitate the learning of social skills, executive functions, and organizational abilities by autistic learners. This literature analysis also grounds the current study in prior research to make it realistically relevant and transferable to policy and practice. The significance of teaching strategies in directing the effective teaching and learning of diverse behaviors, skills, and information informs the study and literature review. Subject-specific or generic material cannot be provided without a realistically appropriate technique, as a general rule of pedagogy.

Similarly, organizing skills cannot be taught to pupils efficiently without a sound technique, such as using binders. The literature review discusses binders' use to teach organizational skills to young students with ASD. The review evaluates binders as a tool for increasing routines, engaging in tasks, and acquiring social skills. Following the review, the chapter provides a summary of the review and a discussion.

Using Routines

Routines are a method of doing a task the same way every time someone encounters the task. To help autistic students develop practical organizational skills, the teacher can leverage the awareness and adherence to various routines in school (Barnett, 2018). These routines can be conducted inside or outside the classroom. The bottom line is to conduct an activity so frequently and similarly each time that the task becomes part of the student's habits. Routines are performed

each school day, developing habits that make executive functioning easier. Once formed as habits, the students do not have to recall or think intensively before engaging in the task. This frees up mental energy to effectively focus on academic work while strengthening organizational skills and executive functioning. Learners can efficiently develop routines and improve their executive functioning abilities using binders. Executive function is a precondition for the development of organizational skills. Consequently, binders efficiently serve as routine reminders of various chores and occasions, assisting the student in establishing a pattern and strengthening their executive function and organizing abilities.

In their study, Gardiner and Iarocci (2017) looked at the relationship between parent-rated Executive Function (EF) (independent variable) and adaptive functioning and depressive symptomatology (the dependent variables). This study was designed to hypothesize that identifying the specific EF domains most strongly aligned to these indices of functioning reveals areas where targeted intervention is necessary. The study used 126 participants (children and adolescents), including 59 with autism spectrum disorder (ASD) and 67 typically developing (TD) (Gardiner & Iarocci, 2017). The Behavior Rating Inventory of EF (BRIEF) and the Behavior Assessment System for Children, Second Edition, was completed by caregivers (BASC-2). Apart from organization of materials (BRIEF) and anxiety (BASC-2), parents judged children with ASD as having significantly more difficulty on most of the BRIEF and BASC-2 indices and ratings (BASC-2) (Gardiner & Iarocci, 2017).

Metacognitive EF processes were found to be highly linked to both groups' practical, conceptual, and social abilities; however, distinct BRIEF scales were found to be significant across the component subdomains. In terms of mental health, the BRIEF index scores for both groups were unrelated to anxiety. On the other hand, behavior regulation was linked to

depression symptoms in autistic and typically developing children. Based on the study of the causal relationship between the variables, the study was quasi-experimental since the researchers controlled the variables, albeit not all the variables (Gardiner & Iarocci, 2017). The findings suggest that addressing specific EF domains in people with and without ASD may have benefits not just for impulse control and cognition abilities but also for other aspects of life, such as adaptive behavior and associated internalizing symptomatology (Gardiner & Iarocci, 2017). Everyday executive function reinforces routines that have a direct impact on cognitive function. The advancement of metacognitive processes due to routine activation strengthens the student's ability for self-regulation and organization.

In analyzing routine formation for organizational skill training, Kang and Chang (2017) examined the impacts of continued exposure to technology on forming independent showering as an organizational skill. The study used the Kinect sensor to make shower training more fun for the study participants. To demonstrate the relationship between game-based intervention and independent shower-taking, the study used a non-concurrent multiple baseline design. The participants were six children from a conventional elementary school's special education class. The independent variable was gamification, while the dependent variable was the learner's ability to shower independently. The study found that the percentage of correct task steps increased significantly among all six participants.

Furthermore, continued induction in the game increased motivation to engage in the training (Kang & Chang, 2017). This study shows the essence of using technology to reinforce routines and enhance organizational skills for autistic children. However, the study could be limited in application since its use depends on the technological competency of the child. Regardless, the study shows technology as a potent tool to reinforce routines.

Hampshire et al. (2016) investigated the effects of a multi-level intervention package combining parents as interventionists and self-management on learner levels of independence concerning homework completion and accuracy as measures of organization. The research was motivated by the observation that homework completion and accuracy are common organizational issues for students with ASD. Independent factors were the intervention package, whereas dependent variables were homework completion and accuracy. Utilizing a multiple baseline experimental design, the study discovered that the learners' task independence improved following exposure to the intervention package. The intervention package induced a homework schedule that allowed the participants to succeed academically (five Grade 6-8 learners). Homework engagement is a measure of task independence, which is essential for organization, and may be achieved most effectively through continual involvement (routine development). However, this study's sample size was modest, reducing the generality of the findings.

Task Engagement

The acquisition and maintenance of organization skills require some degree of mental and psycho-emotional commitment by the learner. For this reason, task engagement is critical (Barnett, 2018). Task engagement ensures the learner understands various aspects of the tasks to facilitate organization. Kim et al. (2018) investigated how shared reading interventions impact narrative story comprehension and task engagement in elementary school students with autism spectrum disorders. This study is based on the research finding that autistic children have difficulty maintaining focus on a task, especially if they are doing it on their own. Group interventions are designed to encourage children to stay engaged in tasks longer. As a result, shared reading mimics a group atmosphere, which may increase the children's task engagement.

Furthermore, task engagement has been identified as necessary for developing strong organizational skills in children with autism.

The participants were three elementary school children ages 6, 7, and 8 receiving therapy at a local autism clinic in Midwest US. The study was done in an empty classroom at the clinic (Kim et al., 2018). This was a quasi-experiment with no control group. Their reading comprehension and task engagement were assessed at baseline and after the intervention. The ADOS-2 measurement tool was employed in this investigation. The findings of this study revealed that all participants improved significantly in their reading comprehension and engagement. During follow-up, the gains in task engagement and reading comprehension were maintained (Kim et al., 2018). These findings imply that for primary school students with autism, group exercise improves work engagement and organization skills. Despite its encouraging outcomes, the study's methodological dynamics are severely restrictive and render the conclusions unreliable. For starters, the sample size was extremely tiny, and the findings may not be repeated in a broader population. Second, the findings' validity is hampered by the lack of a control group to compare them to. As a result, a larger sample size (treatment and control) is required to verify the study's validity and reliability.

In another study on task engagement, Novack et al. (2019) examined the efficacy of the Camp Discovery mobile application in teaching language skills to autistic children. The study used 28 participants randomly assigned to the treatment or control group in an experimental research design. The experiment was designed such that both the control and the treatment groups were exposed to the same intervention, with the treatment group being immediately exposed and the control group being delayed exposure. The independent variable was exposure to Camp Discovery, while the dependent variable was language skill acquisition. The study

found higher language gains for the treatment group after four weeks of the intervention, and as compared to the control group. Similar outcomes were observed for the control group upon intervention, showing that exposure to a task positively modulates skill acquisition. Despite these insights, this study lacked methodological rigor (Novack et al., 2019). Exposing both groups to the same treatment, even at different intervals, jeopardizes the effective comparison of findings. To more effectively infer comparisons between group achievements, it is necessary to subject only the treatment group to the intervention of interest.

The time of engagement with a task also improves the learner's competency at the task, which directly builds organizational skills. Zajic et al. (2020) compared task engagement and narrative writing in TD and ASD children. The study used 121 participants (children), including 60 with ASD, 32 with attention deficit hyperactivity disorder (ADHD), and 29 with TD. During the spontaneous narrative writing task, a typical quasi-experimental study measured time spent engaged during writing. The ASD group had the lowest text organization and quality scores and the lowest word production scores and spent the least time on the writing activity (Zajic et al., 2020). After controlling for related age, cognitive skills, and symptom severity variables, time spent engaged was most closely associated with narrative writing scores in the ASD group and explained variation in text organization and quality scores as well as word output scores. As such, time of task engagement was an independent variable, and the scores were the dependent variable. Time spent engaged and word production scores were found to have similar correlations in the ADHD group, and time spent engaged explained unique variance in word output (Zajic et al., 2020). As such, for autistic children, this study affirms that enhancing the time of engagement with tasks is an effective method to reinforce organizational skill

acquisition. This study is highly insightful and beneficial as a general guide on task engagement for skill acquisition.

Stasolla et al. (2014) also conducted a study on the task involvement of autistic children to improve their organizational abilities. They evaluated how self-monitoring may be utilized in the classroom to increase on-task behavior (a function of task engagement). Two boys with high-functioning ASD, ages 7.5 and 8.5, enrolled in the research. The study's dependent variables were the goal behaviors, including on-task conduct, stereotypical behavior, and happiness indices, whereas the independent variable was self-monitoring. A nonconcurrent multiple baseline design was utilized for this study's experimental design. The study's results indicated that self-monitoring improved the participants' on-task behaviors and satisfaction levels.

Similarly, stereotypical behaviors decreased throughout the intervention. This study confirms that active participation in learning by students with ASD is an effective strategy for enhancing organizational abilities. Despite the promise of its findings, utilizing a small sample size of two individuals without a control group compromises the validity and verifiability of this study's conclusions. Redesign the study with a higher sample size and a control group.

To stay engaged in a task, the learner must create and maintain concentration from beginning to end. One of the most challenging factors impedes students' academic and social development with autism spectrum disorders. The introduction of a system that offers the structure for students to independently work through information creates the expectation that, over time, they will require less direct support. Considering that students with autism frequently have short attention spans, limited task engagement, and an inability to sustain effort on a task, binders can be used effectively to provide a comprehensive foundation that supports their confidence in completing the work; in addition to inspiring self-confidence and motivation for

task engagement, binders allow autistic learners time for self-reflection to cement skills learned (Weiss et al., 2010). Binders provide students sufficient time to enhance their social and academic learning by developing and maintaining focus on tasks.

Social Skills

To develop organization skills, the child must have the necessary social skills like language competency and the ability to interact with others socially. The attainment of social literacy helps the child attain self-regulation. Self-regulation is critical for modeling the child's behavior, emotions, attention, and activity levels. These are essential elements of task performance. Organizational tasks always occur within a social environment. Therefore, the child's actions, behaviors, and emotions should be maintained in conformity with the social environment or context – the task performance should be conducted in a socially acceptable manner (Barnett, 2018). Therefore, social skill training is a fundamental aspect of guiding the effecting attainment and maintenance of organization skills within the social contexts of school, home, and community.

Furthermore, self-expression is a crucial ability for the development and improvement of learners' social abilities. For example, communication binders equip kids with the means to successfully communicate their requirements to their classmates through pictures and pre-printed cards (ConnectABILITY.ca., 2010). This is strengthened by using binders, which significantly improves verbal communication and other types of social connections.

In their study, Kenworthy et al. (2014) examined the efficacy of Unstuck and On Target (UOT) as an executive function intervention for autistic children. Participants in their study were third, and fifth-grade students and a controlled, randomized research approach were utilized. They compared UOT to a social skill intervention to assess its efficacy as a feasible intervention

for enhancing the participants' social skills and executive function. Problem-solving, executive functioning, and social skills were among the variables evaluated. The intervention (UOT) was the independent variable, whereas the dependent variables (social skills and executive functioning) were the dependent variables. The participants' UOT and social skills groups improved their target abilities, although the UOT group improved significantly (Kenworthy et al., 2014). Thus, UOT increased executive functioning, a prerequisite for developing organizational abilities. This study demonstrates that executive functioning and social skills are key components of organization in children with autism. The comparison methodology adopted by the study bolsters its dependability for developing pragmatic strategies to improve organizational abilities in autistic students.

Many studies have been conducted on social skill development in children with an autism spectrum disorder. One such study was conducted by Freeman et al. (2017) to develop and investigate the relationship between executive function and social functioning in elementary school students with an autism spectrum disorder. Executive functioning is necessary for developing higher-order talents, whereas social functioning is necessary for daily interactions within the social boundaries of the child's social context. For this study, the executive function was the independent variable, while the social function was the dependent variable. The study was set up as a correlational study, with participants being monitored on the playground to determine the relationship between the two factors. There were 23 primary school pupils in the study, with an average age of 8.6 years (Freeman et al., 2017). The ADOS tool was used to assess social interaction, while the DAS-II tool was utilized to assess executive function.

Learners with lower executive functioning had more difficulty learning social skills and interacting with their peers. During the playground observation, this was demonstrated by a

higher amount of isolation and poorer engagement with their classmates. These findings imply that higher-order cognitive skills such as working memory, task initiation, and organizing and planning skills are all linked to children's social skills (Freeman et al., 2017). As a result, executive function deficiencies caused by autism have a negative impact on social functioning and skill acquisition. This has a direct negative impact on the growth and maintenance of organizational abilities. Despite these findings, the study was constrained by the absence of a comparison group of typically developing children in the same age range as the intervention and control groups.

In another study, Doernberg et al. (2021) investigated the impacts of pretend play on the play skills of children with an autism spectrum disorder in elementary school. Twenty-five elementary school students, ages six to nine, participated in the study. The participants were selected from a local private school with a racially diverse student body. The subjects were chosen after the IRB authorized an informed consent letter submitted to their parents. To determine the influence of pretend play on play skills after five weeks of intervention, the children's baseline play skills were tested at recruitment and again after five weeks of intervention (Doernberg et al., 2021). This study was designed as an experiment in which the influence of an intervention on two groups was measured (treatment and control group). The Affect in Play Scale (APS) and the Kusche Affective Inventory-Revised (KAI-R) were used to assess the children (Doernberget al., 2021). According to the findings, the treatment group had improved cognitive play skills and inventiveness (Doernberget al., 2021). According to these findings, pretend play increases play and associated social skills in elementary pupils. This makes it easier, more measurable, and more accessible to improve early childhood social skills and organizational competency.

Vaiouli et al. (2015) also investigated social communication as a social ability among children with an autism spectrum disorder. The study examined the effects of learner-centered music therapy on the joint attention and social communication skills of three kindergarten students in a classroom context. The study employed a multiple baseline experimental design followed by a qualitative examination of parent and teacher views to comprehend further the moderating effects of the social environment on the development of communication skills in autistic children. The dependent variables were joint attention and social involvement through communication, while the independent variable was music therapy. All students demonstrated improvement in the targeted abilities, particularly social communication. This indicates that music therapy has the potential to improve social skills in ASD children. However, repeat research with larger sample size is required. However, including a mixed-methods design that includes the perspectives of instructors and parents considerably mitigates the limitations of a small sample size.

According to research on the development of social skills, executive function is a crucial foundation upon which social skills and other aspects of the organization are built. Students with autism spectrum disorders lack the executive abilities essential to simultaneously perform several or difficult activities. Therefore, these students require learning aids that assist them with task management to enhance their executive functions. Consequently, binders are an important tool for helping autistic students properly manage complicated or multiple chores by serving as a reference or reminder system for the many tasks due to the learner (Glickman, 2016). Though structured binders would not cure all of their issues, they would make their daily lives more bearable and give resources to assist in their long-term beneficial development.

Conclusion of Literature Review

While autism spectrum disorder is not particularly a learning disorder, some aspects of ASD may challenge regular classroom learning. The ASD children, for example, may not recognize verbal or physical communication signs that TD students ignore. Physical space and bounds may not be respected or recognized, making the transition between activities difficult if not stimulated beforehand. Furthermore, the ASD students' incapability to always show emotional reactions through expected facial expressions like smiles and frowns can make it difficult for people to interpret their emotions. Conversely, these learners are extremely bright, with the majority scoring in the average to the above-average range. As a result, when the goals are explicit and attainable, and the class material is structured and kept at a steady pace, it is simpler for an ASD student to finish tasks.

According to all research evaluated, organizational skill development relies heavily on achieving and maintaining attention. These findings also indicate that students with ASD are primarily visual learners. As individuals with ASD are predominantly visual learners, classrooms should use various audiovisual materials. Binders are a useful audiovisual tool that can assist students with ASD in developing and maintaining organizing skills. Binders aid in the development of fine motor skills and psychomotor coordination, promote the development of self-regulation in order to be task-focused, foster routines, and foster social skills. In addition to audiovisual learning aids, learners with ASD may utilize assistive technology to boost their development of organizing skills. While these aids can be used alone, the inclusion of binders enhances their efficacy. Moreover, binders facilitate the development of consistency and repetition in task performance, hence facilitating the development of tasks as habits and routines to further enhance organizational abilities.

Doernberg (2021) presents the most comprehensive discussion on increasing organizational abilities in autistic children, asserting that the learner cannot be self-reliant and competent if their social integration is impaired. Play is essential for elementary school students' higher-order cognitive and social abilities. Binders give the required tool for students to organize and manage their time, enhancing their autonomy. As demonstrated by these investigations, organization is a taught skill that may be effectively and successfully transmitted to the learner. If done effectively, the organizing skills developed in childhood produce lifelong rewards. This improves the child's growth and life experiences, eradicating stigma and prejudice from their peers and society.

Discussion of Literature Review

From this review, ASD students have special needs that the teachers must pay attention to enhance their organization skills. First, the teacher must acknowledge that ASD is not a learning disorder but a social relational disorder. By understanding the students and their needs, the teachers can design and implement effective teaching modalities to impart student organization skills. Such strategies should be coordinated with the parents to enhance the students' organization skills at home and school. The three primary strategies described in this review are particularly effective in imparting organization skills. These strategies require the establishment of focus on the organization task and advance self-regulation and management as the core of organization skills. To be more effective, teachers should implement these strategies complementarily. However, strategies should be introduced sequentially to enable systematic learning.

Chapter 3

Methods

Capstone Research Hypothesis

When primary school students are exposed to the usage of binders, their academic engagement and content organization will increase by at least 50 percent. In comparison, their social engagement and time management will increase by at least 70 percent and 50 percent, respectively.

Participants

The study participants will be six elementary school learners (three for the test group and three for the control group). The test group will include three elementary school learners – A, B, and C – aged nine, eleven, and thirteen, respectively. The learners will be recruited from Grade 5 – 7 at a local public elementary school. The learners' autism diagnosis will be screened based on the DSM-IV criteria confirmed through an independent diagnosis of autism by a relevant mental and behavioral health agency before enrolling in the study. The participants, by gender, will include two boys (A and C) and one girl (C). Participants' school scores and observed levels of organization will be self-reported by the teacher, who will be the leading provider of the intervention during the study. The sample will be used as a representation of the elementary school learner population with moderate learning difficulties due to their ASD diagnosis. Communication binders are a proven tool that helps learners communicate via visual aids as an alternative to verbal communication. Besides, the visual aids can be effectively used to supplement the progress of academic and social achievements of learners with ASD. These learners have limited verbal communication abilities, which may significantly affect their academic and social involvement within the school and home environment. Therefore, graphic

communication binders are a critical influence towards improving these learners' organization skills through enhanced academic engagement and social involvement. Throughout this study, the participants' names will not be revealed to the researcher. Instead, the intervention teacher will code the participant names PA, PB, and PC. Coding participant names will help uphold the participant's privacy and confidentiality during the study. Before any interaction of the participants by the researcher or the teacher for this study, parental informed consent will be sought. The seeking of parental consent, besides the consent from the school authorities, will enhance the research ethics and integrity of the proposed study.

Inclusion and Exclusion Criteria

The study will rely on a stringent criterion for the inclusion and exclusion of participants. Using inclusion and exclusion criteria enhances the accuracy and practical significance of the study's outcomes for further studies or similar studies with different samples and populations. In order to be eligible as a participant in this study, it will be mandatory for the student to be aged between seven and fifteen, have an independent diagnosis of autism spectrum disorder from a qualified health professional, and display reported difficulties of deficiency in organization arising directly from their ASD diagnosis, and have no other learning disorder or mental health problem that may compound or in any way interfere with the impacts of their ASD diagnosis on learning. In order to ascertain these criteria, the study will consult a qualified developmental/mental health expert to independently confirm the ASD diagnosis and rule out the existence of any other interfering condition.

Any participant who does not meet the above specifications will be excluded from the study. In addition, exclusion from the study will be based on the presence of any problematic learning or developmental behaviors that may impede the learner's sustained participation in the

study. Further, learners who cannot sustain attention for at least one study session will be excluded. Also, any student on any medication that may enhance or depress their moods, energy levels, or motivation during or at least one week before the study will be excluded. Finally, learners who will be on cognitive therapies for the ASD outside the school environment during or at least one month before the study will be excluded.

Screening to Pinpoint Target Behavior

The targeted behavior for this study will be the ability of the student to independently organize their academic content and effectively use pictures and visual aids to communicate their attitudes and feelings effectively. Furthermore, time management will be a target behavior for this study. Specifically, this study will identify how the learners use binders to organize their class content, manage time between various subjects and activities, and better communicate or socialize with peers, teachers, and parents (the home environment). In order to screen for academic engagement (content organization), time management (time spent during transitions between classes or activities), and social engagement (attitudes and communication with peers and non-peers), the participants will be screened through a pretest procedure. First, the learners will be asked to locate a specific subject material (a book) from a collection of materials (books) kept by the learner in their lockers.

Next, the learners will be required to engage in a question-and-answer session with their teacher, where they will be required to randomly answer questions regarding their mood, feelings, and emotions towards various objects. Another session will also involve questions and answers about class transitions. During the screening, the response rate and correctness will be recorded through questions and answers. For every question posed by the teacher, the researcher will record whether the student has answered the question or not and whether the answer given is

correct or wrong. From this screening, the dependent variables measured will be the fraction of questions answered by every participant (this will denote the student's participation in the screening). Furthermore, the fraction of correct responses will be recorded during the screening.

Setting and Arrangement

The study will occur within the classroom environment in small three-member groups under the teacher's supervision. These sessions will be only for the study participants. The teacher will be the interventionist in this study, while the researcher will be the supervisor throughout the study. The study sessions will be carried out within an isolated room within the school that will act as the classroom for the study. The students not participating in the study will go through their regular school routines in their usual classrooms.

Materials and Equipment

The study will primarily rely on graphic binders to gauge the learner's target skills and behavior. As such, the study will use response cards designed by the researcher as small photographs (5cm by 5cm) with images corresponding to the answers to the various questions the teacher will ask as part of the intervention. The response cards will be identical for every participant, and the response card binders will be distributed to every participant. During the intervention, every participant will be provided with a binder that will match the questions asked by the teacher. Every binder will have 24 response cards, eight pages each containing four cards. Every binder page will be colored differently to correspond with specific lesson topics. Paper glue will attach the response cards to the binder pages.

Response Definitions and Data Recording Procedures

The sessions will begin with the interventionist (the teacher) calling the participants' attention by inviting them to the session through the phrase "Welcome, and let's picture the world!" This phrase will alert the participants to the beginning of the binder exercises. The target behavior for the sessions will be to enhance academic and social engagement and time management. The target behavior will be demonstrated by matching the picture to the corresponding answer to the interventionist (the teacher) questions. A mismatch between the photo and the corresponding answer on the binder will be considered an incorrect response and a failure to attain the target behavior.

The expected outcomes will be at least 50% improvement in the target behaviors; that is, at least a 50% improvement in time management, academic engagement, and content organization, as well as a 70% improvement in social engagement. These performance measures will be measured within the eight weeks of the study, with a one-week baseline, four weeks of intervention, and three weeks of maintenance. During the intervention period, the participants will be observed for target behaviors without administering the interventions.

Participation. At baseline, the study will define participation as the act of a participant raising their hand in response to the question by the teacher during the sessions. A hand will be raised if it is at least above the head (high enough to be noticed by the teacher). Besides raising the hand, participation will be gauged as responding within ten seconds of the teacher posing the question. During the intervention phase, participation will be defined as the act of a participant taking out a response card from the binder within ten seconds and holding the card high enough for the teacher to see. The response will be elicited by the teacher issuing the statement “Pictures up.” The frequency of participation will be recorded for every session. The frequency of responses

will then be divided by the number of questions the interventionist poses to generate the percent participation per intervention session.

Correct responding. At baseline, correct responding will be defined as the independent raising of the hand to correctly answer the teacher prompt by the learner within ten seconds of being picked by the teacher to respond. A correct response by the participant not preceded by a hand raising will not be considered a correct response. During the intervention phase, correct response will be defined as the participant taking out and holding up the correct response card from the binder within ten seconds of the teacher issuing the prompt, "Pictures up." Correct responses will not be recorded if the participant holds up the wrong response card in response to the interventionist's question or if the participant puts their hand on the correct response card without removing and holding it up, or if the participant will require further prompting to remove and hold up the correct response card. The percent of correct responses for every session will be calculated by dividing the frequency of correct responses by the number of questions posed by the interventionist per session.

Research Method and Experimental Design

The study will need to collect data on observed student behaviors when exposed to the use of binders as well as the reporting by parents and teachers on the progress in skill development by the learners. As such, this study will need to collect both qualitative and quantitative data. Consequently, this study will use the mixed-methods research method to collect and analyze its data (Cook & Cook, 2016). Despite the reliance on both qualitative and quantitative data, the bulk of the study will involve collecting quantitative data from the learners to observe and monitor their behaviors.

For the experimentation, the study will use the nonrandomized pretest-posttest design. This design is practical because the study will be conducted in a classroom setting where randomization may disrupt the regular learning schedules (Cook & Cook, 2016). In this design, the study will utilize two groups of participants; the treatment and control groups (Cook & Cook, 2016). Both groups will be composed of students with ASD (three per group, total of size study participants). The participants' social skills and executive function will be measured before and after the intervention. The test group will be issued with color information binders as an organizational aid to organize their classwork during the study.

In contrast, the control group will not be offered any binders. After the four weeks of intervention, the use of binders will be withdrawn, and the social skills and executive function will be measured again. During the three weeks of maintenance, the teacher and parents will observe the participants' social skills and executive function to report noted changes. These measures and parent and teacher reports will be used to deduce the impacts of binders on executive function and skill development in autistic learners.

Intervention General Procedures

The study will be conducted in three phases: a short baseline phase, the intervention phase, and the maintenance phase lasting eight weeks. During the baseline phase, the study participants will complete the question-and-answer session by raising their hands to answer the question asked by the teacher. This will prime the participants for using binders to respond to teacher prompts and questions during the intervention phase.

The intervention will begin in the week immediately following the baseline phase. During this phase, the participants will receive the study interventions during designated times in the evenings after the regular school day. The intervention sessions will be 30 minutes each, with

one session per day for four days of the week (Monday, Tuesday, Thursday, and Friday). During this phase, the participants will be subjected to the intervention outlined in the preceding section (Response Definitions and Data Recording Procedures). The teacher (interventionist will observe the participants and record the data.

For the maintenance phase, which will occur during the last three weeks of the eight weeks, the students will continue to be under call-and-display instructions without using the response cards. Instead, the students will be observed as they respond to the teacher during regular classes with their peers (non-participants in the study). This will help gauge their acquisition of target behavior and skills. Furthermore, the teacher and parent reports on target behavior will be recorded during the maintenance phase to gauge the progress achieved during the intervention.

Overview Description of Conditions

The study will be conducted in the three phases as outlined above for a total of eight weeks. Phase 1 will be the baseline occurring over the first week of the study, where the pretest will be administered. The pretest will include teacher prompts and questions requiring learner responses without using the response cards. Phase 2 will be the intervention phase, proceeding for four weeks following immediately after the baseline. Here, similar procedures for the baseline will be used, but the responses will be in the form of a response card corresponding to the question and prompts issued by the teacher within ten seconds. Phase three will be the maintenance phase, proceeding over the final three weeks immediately following the intervention. During this phase, parent and teacher reports of learner behavior will be assessed to gauge the improvements in the targeted behavior. Furthermore, the learners will be observed in their mainstream classroom as they answer questions and respond to various teacher prompts.

Baseline (Probe)/Pre-test Procedure

The baseline sessions will begin with the interventionist giving the participants an overview of the lessons they would cover. For instance, the interventionist will pose, "For this lesson, we will raise our hands to respond to various questions. If any of you knows the answer, you will raise your hand, and I will pick you to give us the answer". After the introductory overview, the interventionist will ask the participants questions. After every question asked to the participants, the interventionist will provide the participants with a ten-second window within which, if one or more participants raises their hand, the interventionist will pick one participant to answer. If no participant raises their hands to answer the question, the interventionist will randomly select one participant and prompts them to answer the question. These prompts will be for the participant to answer the question, not raise their hand. To enhance the accuracy of the estimations arising from these procedures, the interventionist will strive as much as possible to maintain the session as similar to a routine classroom lesson as possible. The interventionist will strive to minimize possible risks of participant frustrations or emotional distortions in response to the study conditions. Such frustrations can potentially derail participation in the study. As such, the interventionist will follow every response with a compliment or encouragement to simulate a regular classroom; correct answers will be by praise, while a correction of the error will follow incorrect answers by the interventionist by stating the correct answer and prompting the participant to repeat the correct answer after him then following by praise.

Intervention (Response Card Use) Procedures

The interventional procedures will be modeled similarly to the baseline procedures. However, the only difference between the two phases will be that the intervention will involve the participants answering the interventionist's prompts and questions using binder response

cards. Thus, the session overview prompt for the intervention phase was, "For this lesson, we will raise our hands to respond to various questions. If any of you knows the answer, you will raise your hand, and I will pick you to give us the answer. Once you are picked to answer, you will take the correct response card from your binder and hold it up for all of us to see".

Reliability

The interventionist will collect the data for every session over the eight weeks of the study. Besides the data by the interventionist and the parent/teacher observations, a secondary observer will be involved in collecting the data/observation and recording student activity during the study. The secondary observer will not be involved throughout the study; he will be involved in data recording and observation for two days of the baseline, one week of the intervention, and five days of the maintenance phases. The independent data observed by the secondary observer will generate the interobserver agreement for the study. Two secondary observers will be involved in the study to gather the interobserver agreement data. The first secondary observer will be the local behavior specialist with over seven years of experience as a certified behavior analyst. The second secondary observer will be a school district's certified speech and language pathologist. This specialist has over 20 years of experience as a communications expert working with learners with various learning and developmental disabilities affecting their language abilities. The agreement of observers will be determined by a point-by-point agreement method to calculate the percentage of interobserver agreement; this will indicate the reliability of the study methodology and subsequent findings.

Chapter 4

Data Analysis

This study will use graphical methods to visually assess and present the data for the data analysis. The graphical methods will mainly be used to inspect the data collected in the study for level, variability, trend, the immediacy of the effect, consistency, and overlap of patterns across the baseline and the intervention phases of the study. This will be useful in determining the causal or functional relationship between the interventions and the target behaviors. To generate these graphs, the analysis will use summary statistics to generate the ranges and means of students responding during the study for every phase. These summary statistics will be useful in augmenting the visual analysis of the graphs.

Further analysis will involve the confirmation of functional relationships between the intervention and the target behavior. After this, the study will estimate the effect sizes from these relationships using the Tau-U method. Tau-U is a non-parametric statistical technique based on data points that do not overlap (Lee & Cherney, 2018). The method yields effect sizes that are estimated with specific confidence intervals. The Tau-U method of analysis controls the baseline trends; hence is appropriate for datasets that contain data points within autocorrelated phases and are serially dependent but that fail to satisfy the assumptions of normal distribution (Lee & Cherney, 2018). The analysis will use Tau-U cut points between the 93 and 100 marks for significant effects, 66 and 92 for medium effects, and zero to 65 for small effect sizes. To effectively construct the data analysis, the data series obtained for the three study participants for the baseline and intervention phases of the study will be entered into an automated online calculator. This online calculator will generate the estimated Tau-U values (Lee & Cherney,

2018). Furthermore, phase contrast data will be generated for every data series in the study. The phase contrasts for the phases will then be combined to yield a weighted effect size estimate for every study-dependent variable.

Conclusion

In this study, the researcher expects that the learners will considerably improve their social engagement and academic organization skills by at least 50% from the baseline during the intervention. During the maintenance phase of the study, it is expected that the gains made by the participants during the intervention will be further improved or maintained at the acquired levels post-intervention. Furthermore, the study expects that the baseline scores on the target skills will be the lowest, and the scores will consistently improve throughout the intervention. From the anticipated trend in study outcomes from the baseline and the study progress, the research anticipates that the use of binders will be an effective method of teaching students with ASD organizational skills necessary for academic and social learning. Beyond the study data collected during the baseline and the maintenance phases, the study anticipates that the data collected during the maintenance phase will be critical in affirming the effectiveness of binders in creating lasting gains in organizational skills for learners with ASD. As such, this study predicts that binders are an effective tool for acquiring and retaining organizational skills critical for lifelong learning in learners with ASD.

Discussion

This study has been instrumental in improving my skills as a special needs teacher in enhancing the acquisition of essential skills for autistic learners. Before this study, I was superficially knowledgeable about the tools applicable to enhance organizational skills for autistic learners. I primarily approached students with ASD using modifications of traditional

approaches like active teacher-learner vocalization and repetition of activities to reinforce skills. I initially perceived the tools to teach organization skills to learners with ASD as significantly costly methods that are not accessible to all learners. I associated these tools with technological interventions like mobile games and other software applications. However, this study has made me understand that assistive tools for organizational skill learning in autistic learners do not have to be expensive or prone to barriers like technological efficacy. Going forward, I intend to increasingly use these inexpensive aids like binders to enhance academic organization and social skills acquisition in ASD learners. This will enhance improved learning outcomes for the learners without additional cost implications for the parents.

Furthermore, this research offers me an opportunity for self-reflection and improvement as a teacher. The best way to continuously improve the delivery of content to the learners is to constantly stay updated with information regarding evidence-based practices to enhance teaching and learning outcomes. The available resources to the teacher are endless, ranging from teacher workshops, colleagues, and the internet.

The study is conducted based on the hypothesis that when elementary school learners are exposed to the use of binders, their academic engagement and content organization will improve by at least 50%. In comparison, their reciprocal social engagement will improve by at least 70%, and time management will also improve by at least 50%. The hypothesized improvements are measured in terms of the correct response rates achieved across the experimental phases. As such, comparing the response rates during the study is an indicative measure of the attainment of the targeted behavior during the study. When the data for correct responses are analyzed, as shown in Appendix B, the students A, B, and C responded correctly to the teacher queries with the correct response card for 79%, 60%, and 44% during the study of the prompts respectively.

When this is averaged, all participants' correct responding rate is 61%. The responding using response cards was used as a one-off measure of academic organization, social engagement, and time management. Thus, the hypothesis on content organization and time management is achieved while the hypothesis on reciprocal social engagement is not attained. However, the difference between the hypothesis and the achieved average is not large, signifying those significant gains have been made in reciprocal social engagement.

With the considerable gains anticipated during this study using binders, it can be deduced that teaching organizational skills to learners with ASD can be effectively and objectively achieved without having to rely on expensive technologies like software. As long as the tool is appropriately targeted for a skill, the learners can gain maximally from its use. Limited access to technology has been proven as a significant impediment to the access to practical teaching tools for learners with ASD. Binders can effectively plug this gap and enable organizational skill teaching and learning at drastically lower costs compared to technological aids. Furthermore, the use of binders is simple and requires minimal pre-training of the teacher to implement in the classroom effectively. The use of binders does not significantly alter the dynamics of the traditional classroom. As such, binders can be effectively integrated into existing classroom dynamics without offsetting the flow of teaching and learning for the teachers and learners.

Therefore, the findings from this study will further reinforce the case for binders as an effective yet cheaper tool for effective teaching of organizational skills for learners with ASD. The binders can be used as a standalone tool or seamlessly integrated into other existing tools and techniques to enhance the desired outcomes. While this data seeks to provide evidence for the application of binders to teach organizational skills, further research should build on the outcomes of this study to investigate the effects of withdrawing binders use to understand the

sustained impacts of binders as a means to instill lasting gains in organizational skills for learners with ASD. Furthermore, a study on the longer-term benefits of binders should be designed to last an extended study duration such as the entire school year and cover a much larger sample size.

References

Bice, H. (2009). Behavioral Strategies for Students with Autism in the General Education Classroom. Retrieved from https://files.eric.ed.gov/fulltext/EJ1137060.pdf

Child's communication binder. ConnectABILITY Childs Communication Binder Comments. (2021). Retrieved from https://connectability.ca/2010/09/23/childs-communication-binder/

ConnectABILITY.ca. (2010, September 23). *Child's communication binder*. ConnectABILITY | Resources for people with a developmental disability and their support networks. https://connectability.ca/2010/09/23/childs-communication-binder/

Cook, B. G., & Cook, L. (2016). Research designs and special education research: Different designs address different questions. *Learning Disabilities Research & Practice*, *31*(4), 190-198. https://doi.org/10.1111/ldrp.12110

Doernberg, E. A., Russ, S. W., & Dimitropoulos, A. (2021). Believing in Make-Believe: Efficacy of a Pretend Play Intervention for School-Aged Children with High-Functioning Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 51(2), 576-588. https://doi.org/10.1007/s10803-020-04547-8

Freeman, L. M., Locke, J., Rotheram-Fuller, E., & Mandell, D. (2017). Brief report: Examining executive and social functioning in elementary-aged children with autism. *Journal of autism and developmental disorders*, *47*(6), 1890-1895. https://dx.doi.org/10.1007%2Fs10803-017-3079-3

Gardiner, E., & Iarocci, G. (2018). Everyday executive function predicts adaptive and internalizing behavior among children with and without autism spectrum disorder. *Autism Research*, *11*(2), 284-295. https://doi.org/10.1002/aur.1877

Glickman, B. (2016, August 15). *Executive function challenges in children with Asperger profiles – The Asperger / Autism Network (AANE)*. The Asperger / Autism Network (AANE). https://www.aane.org/executive-function-challenges-children-asperger-profiles/

Hampshire, P. K., Butera, G. D., & Bellini, S. (2016). Self-management and parents as interventionists to improve homework independence in students with autism spectrum disorders. *Preventing School Failure: Alternative Education for Children and Youth*, *60*(1), 22-34. https://doi.org/10.1080/1045988X.2014.954515

Hart Barnett, J. (2018). Three evidence-based strategies that support social skills and play among young children with autism spectrum disorders. *Early Childhood Education Journal*, *46*(6), 665-672. https://doi.org/10.1007/s10643-018-0911-0

Kang, Y. S., & Chang, Y. J. (2019). Using game technology to teach six elementary school children with autism to take a shower independently. *Developmental neurorehabilitation*, *22*(5), 329-337. https://doi.org/10.1080/17518423.2018.1501778

Kenworthy, L., Anthony, L. G., Naiman, D. Q., Cannon, L., Wills, M. C., Luong-Tran, C., ... & Wallace, G. L. (2014). Randomized controlled effectiveness trial of executive function intervention for children on the autism spectrum. *Journal of Child Psychology and Psychiatry*, *55*(4), 374-383. https://doi.org/10.1111/jcpp.12161

Kim, S. Y., Rispoli, M., Lory, C., Gregori, E., & Brodhead, M. T. (2018). The effects of a shared reading intervention on narrative story comprehension and task engagement of students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *48*(10), 3608-3622. https://doi.org/10.1007/s10803-018-3633-7

Lee, J. B., & Cherney, L. R. (2018). Tau-U: A quantitative approach for analysis of single-case experimental data in aphasia. *American Journal of Speech-Language Pathology*, *27*(1S), 495-503. https://doi.org/10.1044/2017_ajslp-16-0197

Novack, M. N., Hong, E., Dixon, D. R., & Granpeesheh, D. (2019). An evaluation of a mobile application designed to teach receptive language skills to children with autism spectrum disorder. *Behavior analysis in practice*, *12*(1), 66-77. https://dx.doi.org/10.1007%2Fs40617-018-00312-7

Stasolla, F., Perilli, V., & Damiani, R. (2014). Self monitoring to promote on-task behavior by two high functioning boys with autism spectrum disorders and symptoms of ADHD. *Research in Autism Spectrum Disorders*, *8*(5), 472-479. https://doi.org/10.1016/j.rasd.2014.01.007

Vaiouli, P., Grimmet, K., & Ruich, L. J. (2015). "Bill is now singing": Joint engagement and the emergence of social communication of three young children with autism. *Autism*, *19*(1), 73-83. https://doi.org/10.1177%2F1362361313511709

Weiss, M., Pearson, N., Foley, K., & Pahl, S. (2010). The importance of fluency outcomes in learners with autism. American Psychological Association. Retrieved from https://psycnet.apa.org/fulltext/2011-20549-003.html

Zajic, M. C., Solari, E. J., McIntyre, N. S., Lerro, L., & Mundy, P. C. (2020). Task engagement during narrative writing in school-age children with autism spectrum disorder compared to peers with and without attentional difficulties. *Research in Autism Spectrum Disorders, 76*, 101590. https://doi.org/10.1016/j.rasd.2020.101590

Appendix A

Data Collection Sheet

Data Collection Sheet for the Intervention Phase

Participant Code: _____

Baseline Score: _____

Session: _____

Trial/Hand Raised	**Correct Response**	**Incorrect Response**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Total Response Count		
Response Percentage (%)		

Appendix B

Data Summary Table for the Baseline and Intervention

a) Participation

	A	B	C
Hand Raising			
Baseline	15%	15%	15%
Week 1 intervention	20%	50%	20%
Week 2 intervention	20%	50%	20%
Week 3 intervention	30%	60%	20%
Week 4 intervention	40%	66%	20%
Response Card			
Baseline	65%	86%	31%
Week 1 intervention	78%	89%	60%
Week 2 intervention	83%	100%	62%
Week 3 intervention	91%	100%	78%
Week 4 intervention	100%	100%	100%

b) Correct responding

	A	B	C
Hand Raising			
Baseline	0%	0%	3%
Week 1 intervention	0%	0%	3%

Week 2 intervention	8%	20%	3%
Week 3 intervention	20%	30%	3%
Week 4 intervention	20%	40%%	3%
Response Card			
Baseline	40%	45%	30%
Week 1 intervention	43%	38%	43%
Week 2 intervention	40%	20%	43%
Week 3 intervention	70%	60%	43%
Week 4 intervention	79%	60%	44%