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Flexible Seating in the Classroom

Sara Wright

Northwestern College

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A Literature Review Presented
in Partial Fulfillment of the Requirements
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Table of Contents

Abstract	4
Introduction: Flexible Seating in the Classroom	5
Review of the Literature	7
Types of Flexible Seating in the Classroom	7
Therapy balls.....	7
Disc ‘o’ sit cushions.....	8
Standing desks and foot fidgets	9
Physical Layout and Environment of the Classroom.....	9
Benefits of Flexible Seating	13
Engagement.....	13
Behavior.....	15
Movement.....	16
Social impacts and student choice	18
Challenges of Flexible Seating	19
Expense	19
Storage and space.....	20
Discomfort and balance	20
Incorrect use.....	21
Student Perceptions of Flexible Seating	22
Teacher Perceptions of Flexible Seating.....	23
Parent Perceptions of Flexible Seating	25
Autism Spectrum Disorder and Flexible Seating.....	26

Attention Deficit Hyperactivity Disorder and Flexible Seating	27
Recommendations for Further Study	29
Conclusion	31
References	32

Abstract

This literature review discusses flexible seating in the classroom. It explains specific types of flexible seating that was found in recent relevant research most often. These seating types are therapy balls, inflatable cushions, standing desks, and foot fidgets. Next, the importance of the physical layout and environment of the classroom is examined. This literature review goes on to explore the benefits and challenges of flexible seating. Some benefits are engagement, positive behavior, movement, social impacts, and student choice. Some challenges are expense, storage and space, discomfort and balance, and incorrect use. There are multiple considerations educators need to take when deciding whether to implement flexible seating into the classroom, such as special needs, preferences, and available space. Students with autism spectrum disorder or attention deficit hyperactivity concerns appear to improve levels of engagement and/or behavior when using flexible seating. This literature review also discusses student, teacher, and parent perceptions of flexible seating, all of which are mostly positive. Further study is needed on long-term effects of this intervention, how students transition to new classrooms with or without flexible seating, using it in higher grade levels, and in how to implement flexible seating into a classroom.

Flexible Seating in the Classroom

Flexible seating is a trend in education that allows for more student choice and possibly more engagement and focus in the classroom. Stapp (2018) stated that time on-task is an imperative topic that educators should focus on and research more. Flexible seating is an alternative to the traditional desk and chair, and comes with many options. Educators may use wobbly chairs, carpet squares, beanbags, cushions, stools, balls, crates, benches, small couches, scoop rockers, floor tables, floor pillows, standing tables, and more to achieve flexible seating options in their classroom. While some teachers allow this choice for only certain times of the day, other teachers let students use flexible seating all day long.

Different seating choices may work better for individual children, which is what some researchers have tried to find out. For example, Fedewa, Davis & Ahn (2015) concluded that stability balls helped decrease discipline referrals in a second-grade classroom, perhaps from the extra physical activity required to use the balls. In the preschool setting inflated seating cushions helped with attention and persistence during circle time (Seifert & Metz, 2017). Furthermore, in a sixth-grade classroom Mead, Scibora, Gardner, & Dunn (2016) noted that stability balls are effective in influencing academic performance.

One major goal of flexible seating is to increase student engagement. Seifert & Metz (2017) found that learning suffers without engagement. The right to choose and a bit of movement that comes with sitting on these seats may be the right combination to boost student engagement. In addition to increasing engagement, standing desks can also help the physical health of students by lowering their BMI (Sorrell, 2019). Stapp (2018) discovered that time on-task increased when fifth-grade students were using cushions as seats. Therefore, flexible seating can benefit students by allowing them to focus better on instruction.

On the other hand, there may also be challenges to flexible seating. Sorrell (2019) stated so many seating options can lead to distractions and a lack of structure in the classroom. Perhaps too many seating options create chaotic surroundings and lead to anxiety for students. Sorrell (2019) also found having these seating options means it costs more money for schools or teachers. This may not be possible for most teachers, and school budgets may not account for these materials. Furthermore, students may argue over certain seats or take too long to pick a seat, causing more work for the teacher.

Multiple studies have been completed on the effects of certain types of flexible seating in the classroom at various grade levels (Bagatell et al., 2010; Burgoyne & Ketcham, 2015; Erwin et al., 2016; Fedewa et al., 2015; Fedewa et al., 2011; Goodman et al., 2014; Mead et al., 2016; Pfeiffer et al., 2008; Schilling et al., 2003; Seifert & Metz, 2017). A number of these studies focused on a specific type of alternative seating and how it affected academic outcomes, behaviors, attention deficit hyperactivity disorder, or students with Autism Spectrum Disorder. This literature review will go in depth into the benefits and challenges of flexible seating. It will also compare a substantial amount of research already done about flexible seating in the elementary and early childhood settings. Lastly, this literature review will discuss the effects of flexible seating on student engagement and student behaviors.

Review of the Literature

Types of Flexible Seating in the Classroom

Flexible seating can include a variety of materials. Research has been done to test the effectiveness of many types of alternative seating choices on student behavior, engagement, academic achievement, and how students interact with one another (Bagatell et al., 2010; Burgoyne & Ketcham, 2015; Erwin et al., 2016; Fedewa et al., 2015; Fedewa & Erwin, 2011; Goodman et al., 2014; Matin et al., 2017; Mead et al., 2016; Pfeiffer et al., 2008; Rollo et al., 2019; Schilling et al., 2003; Schilling & Schwartz, 2004; Seifert & Metz, 2017; Sorrell, 2019; Taipalus et al., 2016; Umeda & Deitz, 2011). The types of flexible seating that will be discussed in this literature review are therapy/stability balls, disc ‘o’ sit therapy cushions, standing desks, and foot fidgets.

Therapy balls Therapy balls have been used in multiple studies about flexible seating in the classroom (Bagatell et al., 2010; Burgoyne & Ketcham, 2015; Erwin et al., 2016; Fedewa et al., 2015; Fedewa & Erwin, 2011; Goodman et al., 2014; Matin et al., 2017; Mead et al., 2016; Schilling et al., 2003; Schilling & Schwartz, 2004; Taipalus et al., 2016). Bagatell et al. (2010) described the therapy ball as a dynamic chair that has a ring or feet at the bottom to keep it stable. Students are able to sit in a variety of positions on the ball, including leaning, kneeling, and shaking (Burgoyne & Ketcham, 2015). It is suggested that student improvements are due to this ability to move around or sit in different ways. Mead et al. (2016) indicated in their research that therapy balls allowed students to gently bounce and have a greater alertness.

Sensory input comes into play with alternative seating options. Erwin et al. (2016) stated that interventions like the therapy ball are necessary for students who may be over- or under-stimulated by their environment so they can receive sensory input while seated. In addition,

Fedewa & Erwin (2011) noted that students were more active on the therapy balls and seemed to enjoy moving around. Another researcher (Schilling & Schwartz, 2004) recommended that students with sensory processing concerns use a therapy ball or something similar to help the student self-modulate sensory input.

Some studies (Fedewa & Erwin, 2011; Goodman et al., 2014; Matin et al., 2017) reported that therapy balls should be individually fitted for each student. This way, students can sit comfortably with their feet flat on the floor. In one study (Goodmon et al., 2014) a certified fitness instructor demonstrated how to sit correctly on the therapy balls. The students were fitted for their therapy balls based on their height by a trained representative from WittFitt before the intervention was implemented (Fedewa & Erwin, 2011). All six of the studies (Fedewa & Erwin, 2011; Goodman et al., 2014; Matin et al., 2017; Mead et al., 2016; Schilling et al., 2003; Taipalus et al., 2016) had children sized to their therapy balls so they could sit with hips and knees at a 90-degree angle and bottom on the center of the ball. Helping children be as comfortable as possible most likely added to their success.

Disc ‘o’ sit cushions Disc ‘o’ sit cushions are round, filled with air, strong enough to sit on, and are designed to provide students with movement while seated in a chair (Matin et al., 2017). Students place the cushions on top of their chair and sit on them. These discs are flat on one side with a bumpy texture on the other side (Stapp, 2018). Stapp (2018) also stated that the vast majority of students in her study reported that the cushions are more comfortable than other seating options in their classroom. The cushions provide sensory feedback and an opportunity for core strengthening (Umeda & Deitz, 2011). Matin et al. (2017) concluded that the cushions provide a more stable surface to sit on than therapy balls and require less balance. Students can be fitted for these cushions. Pfeiffer et al. (2008) stated that the amount of air can be determined

by the child's preference before use. This could make a significant difference in whether this type of flexible seating is successful in the classroom!

Another thing that could make a difference is the size of the items. Cushions are easy to move between classrooms, allow for easier storage than larger items, and can be used discreetly by students (Seifert & Metz, 2017; Umeda & Deitz, 2011). Pfeiffer et al. (2008) also mentioned that cushions are easily used and cost efficient. Cushions can be used in multiple settings, such as in a chair at a desk or at the carpet during whole group instruction (Seifert & Metz, 2017). This is something teachers and students can appreciate. Because of the ease of use, students may be able to use them independently.

Standing desks and foot fidgets Although disc 'o' sit cushions were the focus of her study, Stapp (2018) also discussed standing desks and foot fidgets. Standing desks let students stand or sit, perhaps on a stool, while learning. They are one of the most common and accessible types of flexible seating, and are low cost (Stapp, 2018). The foot fidget is a stretchy band that wraps around the legs of a student chair which allows students to receive some sensory input by pressing on the band with their feet while seated (Stapp, 2018). It seems these bands are easy to attach and relatively not distracting, which would be beneficial to the teacher and other students in the classroom.

Physical Layout and Environment of the Classroom

Teachers are continually searching for ways to create a comfortable environment for learning. At the same time, teachers have a huge responsibility to continually increase expectations for student performance (Pfeiffer et al., 2008). They must take into consideration many things about their classroom size, student needs, and student preferences. Things about the physical layout of the classroom that should be kept in mind are lighting, temperature, seating

arrangements, floors, walls, desks, computers, and whiteboards (Stapp, 2018). Luckily, classrooms are adaptable and have flexible settings that can be arranged for optimal teacher-student interactions (Gremmen et al., 2016).

Teachers need to consider every aspect of their classrooms in order to promote learning. Stapp (2018) stated learning environments that are set up with care are more likely to utilize instructional time to its fullest potential. Having students engaged and on task the majority of the time should be the goal of all educators. Hastings & Schwieso (1995) suggested that physical environments should be in the context of pedagogical purposes. Teachers should create different areas for different tasks by moving furniture around in the classroom just like PE teachers do (Hastings & Schwieso, 1995). Overall, teachers desire a calm, quiet learning environment, which could be achieved by using flexible seating (Matin et al., 2017).

Three researchers (Goodmon et al., 2014; Matin et al., 2017; Schilling et al., 2003) suggested classrooms be set up with special needs in mind. Educators should look at the individual students to determine what works best for them (Goodmon et al., 2014). Likewise, Schilling et al. (2003) said that intervention practices such as using flexible seating should be seen as an inclusive educational practice. Teachers need to create the environment around the students. Adapting the environment to meet the students' needs is a way to address the continual changes of people and tasks (Schilling et al., 2003). For students with special needs, it is important to change the school environment to provide proper interventions (Matin et al., 2017). Matin et al. (2017) continued by saying that educators must understand priorities of their students as well as the available choices of interventions, such as flexible seating. For example, students with autism spectrum disorder need comfortable school chairs to be most successful in a

school environment (Matin et al., 2017). Gremmen et al. (2016) stated that auditory, vision, and height differences need to be considered when seating students as well.

According to Stapp (2018) there is an increasing trend in shifting to student centered seating, also known as alternative seating. Alternative seating may refer to how desks are set up to allow for collaboration, or to different seating types. Traditional, teacher centered, seating involves student desks and chairs in rows which has been around for decades (Stapp, 2018). Stapp (2018) stated that these desks and chairs are not fitted to each child but are made to fit a typical child in that grade level. This does not work for all students. Gremmen et al. (2016) mentioned other types of seating arrangements being U-shaped seating, or undivided arrangements.

In studies done by Hastings & Schwieso (1995) and Bicard et al. (2012) students stayed on task longer while seated in rows working on independent work. However, group seating arrangements were enjoyed more than rows by over three quarters of the students (Hastings & Schwieso, 1995). Researchers (Gremmen et al., 2016; Hastings & Schwieso, 1995) found that group seating promotes interactions, collaboration, and discussions among students. Hastings & Schwieso (1995) found that over half the primary-aged students from their study thought they worked harder on schoolwork while seated in groups.

Seat location can make a big difference for a child. Yi (2019) urged educators to be aware of the physical space in their classrooms. Teachers may need to adapt based on settings and demographics to make sure there are equitable seating patterns (Yi, 2019). Friendships, confidence, leadership, trust, and learning are affected by seat location (Yi, 2019). On the same note, Gremmen et al. (2016) wrote how important seating is since it influences classroom climate and student relationships. Taking this seriously will impact a child's life. Parker et al. (2011)

stated that seat location can affect a student's performance in class. Even other students can affect it! In a study of college seniors, students who sat next to others who participated often increased their own class participation rates (Parker et al., 2011). Teachers also need to think about where to place students, such as in the front or back of the classroom. Students paid more attention when in the front center because of eye contact, proximity, and non-verbal cues (Parker et al., 2011). Bicard et al. (2012) said that seating arrangements can help prevent or eliminate behavior problems.

Classroom management comes into play when setting up a classroom. Teacher beliefs, experience, and gender may affect classroom management and seating arrangements (Gremmen et al., 2016). Since burnout of teachers within the first few years of employment is common, viewing classroom set-up as part of class management is a must (Gremmen et al., 2016). Just like other management techniques, seating arrangements should be looked at as a tool for prevention and intervention, such as behavioral, academic, and social issues (Gremmen et al., 2016). In a study of fifty fourth through sixth grade teachers, the second and third highest reasons for placing a student in a specific location was due to disruptive behavior and concentration problems (Gremmen et al., 2016). Research (Bicard et al., 2012) from a fifth grade classroom found the teacher seated students based on history of difficulty paying attention, disruptive behavior, and being overly social.

Depending on what teachers believe and how their schools are run, it could relate to how they run their classroom. Gremmen et al. (2016) discovered there are student-oriented teachers or subject-oriented teachers, although some teachers can have characteristics of both. Subject-oriented teachers focus mainly on the transfer of knowledge, which goes from teacher to student (Gremmen et al., 2016). Teachers who are more student-oriented take individual differences

among students into account, emphasize collaboration, and focus on cooperation between students (Gremmen et al., 2016). These types of teachers would most likely set up their classrooms with group seating and consider using flexible seating. Flexible seating could be offered as a choice, which is a powerful management technique. After gathering understandings of what students, parents, and teachers prefer, especially when considering flexible seating, teachers can create their positive learning environments (Sorrell, 2019).

Benefits of Flexible Seating

Students and teachers can benefit from using flexible seating in the classroom. Nine studies (Bagatell et al., 2010; Burgoyne & Ketcham, 2015; Fedewa et al., 2015; Matin et al., 2017; Mead et al., 2016; Rollo et al., 2019; Schilling & Schwartz, 2004; Seifert & Metz, 2017; Stapp, 2018) showed that flexible seating can improve engagement in students. Six studies (Fedewa et al., 2015; Fedewa & Erwin, 2011; Goodman et al., 2014; Rollo et al., 2019; Schilling et al., 2003; Schilling & Schwartz, 2004) revealed that flexible seating can improve student behavior in the classroom. Movement is another benefit of flexible seating according to ten studies (Burgoyne & Ketcham, 2015; Erwin et al., 2016; Fedewa & Erwin, 2011; Matin et al., 2017; Mead et al., 2016; Pfeiffer et al., 2008; Schilling et al., 2003; Schilling & Schwartz, 2004; Seifert & Metz, 2017; Stapp, 2018). Other benefits of flexible seating are the social impacts on students, as well as the student's ability to choose their own seat (Sorrell, 2019; Stapp, 2018; Yi, 2019).

Engagement. Student engagement is on the mind of every educator because it is imperative to learning. Teachers want their students to focus on lessons and activities that are done in the classroom to help sharpen their skills. Being engaged in what is being taught is a major benefit of flexible seating. One example that proves this is from a preschool classroom

which used therapy cushions during their circle time. Their data shows that persistence and attention were demonstrated on higher levels when students used the therapy cushions (Seifert & Metz, 2017). An additional study that used therapy cushions found that the majority of fifth graders see this type of flexible seating as beneficial to their learning (Stapp, 2018). Stapp (2018) stated students can concentrate and participate on a higher level when using the therapy cushions.

Another example of flexible seating lending a hand to student engagement is from research about using therapy balls in a second-grade classroom. Fedewa et al. (2015) noted that students who used therapy balls exhibited an increased amount of time on task in the classroom. This on task, or higher engagement, time was specific to students working with the teacher as opposed to independent work (Fedewa et al., 2015). Likewise, in a study by Burgoyne & Ketcham (2015), engagement increased dramatically when using therapy balls! These second graders almost doubled their on-task behavior time while using flexible seating! Mead et al. (2016) also reported that student attention to task may have increased while using stability balls. This study was done in sixth-grade math classrooms, only one of which used the stability balls. One reason the students may have remained focused was that the stability ball made it difficult for students to turn away or look around during lessons (Mead et al., 2016). This increase in engagement also led to higher test scores. Mead et al. (2015) found that improvement in testing scores significantly increased for the class that sat on these stability balls during their study.

Improvements in engagement while using flexible seating also hold true for students with special needs. Three studies using therapy balls (Bagatell et al., 2010; Matin et al., 2017; Schilling & Schwartz, 2004) demonstrated this; however, there were different levels of increased engagement. For Matin et al. (2017) over half the students showed improvements in engagement.

In Schilling & Schwartz (2004) students made significant improvements. There was only a slight improvement in engagement by students in the study by Bagatell et al. (2010).

Lastly, Rollo et al. (2019) reported that evidence shows that alternative seating interventions could be beneficial for improving student engagement. In the vast majority of studies flexible seating improved the attention of elementary students (Rollo et al., 2019). With administration encouraging and urging teachers to find ways to engage students, flexible seating may be a tool more teachers consider.

Behavior. A second major benefit of flexible seating is behavior. Rollo et al. (2019) explained most studies find that alternative seating options lead to better behavioral displays in students. Fedewa et al. (2015) found that student behavior improved while using therapy balls in place of chairs in the second-grade classroom. Behavior referrals tapered off for students using therapy balls as flexible seating (Fedewa et al., 2015). Behavior improvements are much welcomed by teachers!

Teachers from a different study stated that providing students with activity breaks to move around on the therapy balls allowed students to calm down (Fedewa & Erwin, 2011). This is beneficial to teachers and the entire classroom because calmer children help keep the classroom calm. Similarly, Schilling & Schwartz (2004) found that preschool students with autism spectrum disorder increased their engagement levels and greatly improved on in-seat behavior while using therapy balls. This behavior increased across levels, setting, and activities (Schilling & Schwartz, 2004).

Children with dyslexia in fifth grade showed an improvement in behavior while using therapy balls as their flexible seating option (Goodmon et al., 2014). Goodmon et al. (2014) observed this seating intervention modifying good behavior in students, and teachers were

pleased. Likewise, fourth graders with attention deficit hyperactivity disorder were able to improve their sitting behavior while using therapy balls during class (Schilling et al., 2003). Students gave feedback such as “your brain can stay active even when you’re bored”, “they give you freedom to move”, and “my posture improved” (Schilling et al., 2003).

Movement. A third huge benefit of flexible seating is movement. This could look different based on the type of seating provided, such as wiggling on a disc ‘o’ sit cushion or lightly bouncing on a therapy ball. The point is that students have the freedom to move around while seated and learning, which is not the current trend in classrooms.

This movement leads to higher academic achievement since students are paying more attention to their activities and their teachers. Mead et al. (2016) compared three sixth-grade math classrooms using different levels of physical activity to see the impacts on test scores. One class used therapy balls, one class took five-minute activity breaks, and the other stayed a traditional classroom without flexible seating or breaks (Mead et al., 2016). The ability to be constantly moving on the stability balls proved to be more beneficial for academic performance than the other two classrooms’ physical activity levels (Mead et al., 2016). It was also reported by Mead et al. (2016) that the gentle bouncing on therapy balls might stimulate the vestibular, proprioceptive, and somatosensory systems, which appeared to enable focusing.

Students can get sensory input from flexible seating through their movements. Fourth graders with attention deficit hyperactivity disorder used therapy balls to self-modulate their personal sensory needs by gently rocking or bouncing (Schilling et al., 2003). Movement on stability balls helped fourth and fifth graders with attention deficit hyperactivity disorder increase their attention levels and engagement by fulfilling sensory needs (Fedewa & Erwin, 2011). Preschoolers from research by Seifert & Metz (2017) were given therapy cushions and allowed

to wiggle on them during circle time. The cushions are suggested to be used by students with sensory processing issues (Seifert & Metz, 2017). In addition, second graders with attention deficit hyperactivity disorder increased their attention rates while using disc ‘o’ sit cushions in class. (Pfeiffer et al., 2008). Pfeiffer et al. (2008) surmised that disc ‘o’ sit cushions provide proprioceptive and vestibular input needed to maintain appropriate attention levels. This simple act of permitting children to move around on flexible seating seems especially beneficial to students with special needs.

Two other studies of students with special needs showed that movement on flexible seating helped them improve in their classrooms (Schilling & Schwarz, 2004; Matin et al., 2017). Preschoolers with autism spectrum disorder displayed a ton of movement while using therapy balls, but this bouncing and rocking did not interfere with their learning (Schilling & Schwartz, 2004). The teachers were worried at first about the bouncing, but students adapted and were actually more socially responsive while moving on the therapy balls (Schilling & Schwartz, 2004). Comparably, second through fourth grade students with autism spectrum disorder who sat on therapy balls improved their on-task behaviors (Matin et al., 2017). Matin et al. (2017) stated that therapy balls provide students with an opportunity to sit and move at the same time which leads to better productivity.

Fifth graders using disc ‘o’ sit cushions felt that this type of flexible seating is much more comfortable than others (Stapp, 2018). Stapp (2018) said that therapy cushions present a natural range of movement for students while sitting, and also allows for sensory input. Students are able to use these cushions on their chairs, on the floor, or in other places in the classroom.

Therapy balls can provide students with a large variety of movements and seating positions. Burgoyne & Ketcham (2015) described multiple ways second graders used the therapy

balls: bouncing, rocking, stationary, kneeling, W sit, leaning, standing, or with shaking limbs.

All of this movement increased on-task behaviors for these kids! One interesting thing about this study was that students were observed initially and then again three months later. After three months of using the therapy balls students were still moving around, but in a more subtle and controlled way (Burgoyne & Ketcham, 2015). Erwin et al. (2016) also talked about how therapy balls can provide light physical activity for students since they tend to move around while using them. Flexible seating gives students the chance to move around (Sorrell, 2019).

Social impacts and student choice. Other benefits of flexible seating include the positive social aspects, as well as giving students the option to choose their seats. Tammy S. Yi is an orchestra teacher and conductor who used alternative seating in her classroom. Although this comes from a different viewpoint than a general or special education classroom, it is still relevant to the well-being of students. Yi (2019) used scrambled seating, circle seating, and randomization to promote socialization among her students. Scrambled seating considerably encouraged peer collaboration and challenged students to really listen to one another (Yi, 2019). Circle seating created a situation where students have to rely on each other, which builds trust (Yi, 2019). Randomization required students to be reliable and firmly know the parts they are contributing to the group (Yi, 2019). Yi (2019) reported a variety of social benefits from alternative seating: shared leadership, community building, advocacy, diverse friendships, increased self-confidence, and compassion. All of these skills and traits are needed for real life, so flexible seating truly has an impact on people! Gremmen et al. (2016) also stated that social interactions and peer relationships matter. Getting along with others allows for more collaborations, which can affect learning and academic success (Gremmen et al., 2016).

Students enjoyed getting to choose their seats each day and changing their mind throughout the day without getting in trouble in a study by Sorrell (2019). Parents in this study (Sorrell, 2019) said that student choice in the classroom is a great way for students to make decisions for themselves. Sorrell (2019) also noted that students chose to sit by their friends, which did not always create problems. Students chose seats that were comfortable and fun (Sorrell, 2019). Letting students choose their seats also guided them into better learning. Matin et al. (2017) found that providing choices for student with autism led them to better academic experiences. Sorrell (2019) found that kids felt they learned better if they were able to change their seats for each subject throughout the day. Stapp (2018) reported that students decided on which type of flexible seating to use based on comfort and what helped them concentrate better. Making decisions, even simple ones like what seat to use or where to sit, translates to bigger decision-making. People make decisions all day every day, and teachers want to see their students make good ones.

Challenges of Flexible Seating

Expense. The cost is one possible hindrance to implementing flexible seating in the classroom. Some research (Burgoyne & Ketcham, 2015; Fedewa & Erwin, 2011; Sorrell, 2019) discussed what educators said about cost. Sorrell (2019) concluded from teacher interviews that grants could help pay for some seating, but the rest is to be paid out of the teacher's pocket. Burgoyne & Ketcham (2015) also mentioned that teachers in their study had to pay for therapy balls, at least partially, through a grant. It may take time for teachers to acquire all the seating options they would like for their classrooms, especially since grants are not always an option. Grants also take time to write and receive. One teacher had to be thrifty, make a priority list, and look for deals because seating can be expensive (Sorrell, 2019). Another teacher looked to social

media for sales and took quite a while to get everything she desired for her classroom (Sorrell, 2019). Time, money, and effort are things not every teacher has extra of.

Fedewa & Erwin (2011) added to this concern by saying a disadvantage to therapy balls is the cost of replacing them if they break. Any number of things could happen to damage these materials, especially in an elementary classroom! Student often use pencils, colored pencils, and scissors, all of which could puncture the therapy ball. Also, the cost of therapy balls must be considered since school resources are often limited (Fedewa & Erwin, 2011).

Storage and space. A second challenge presented by one type of flexible seating is space and storage. Having enough space and storage for therapy balls may be a major problem for teachers as classrooms vary in size. The number of students in one classroom also fluctuates year to year, which could affect available space. Matin et al. (2017) reported that therapy balls have their limitations due to taking up larger space which could cause storage or usage problems in a small classroom. Storing twenty to thirty therapy balls in an elementary classroom is not an ideal situation. Concerns from teachers about storing therapy balls were also reported in research by Taipalus et al. (2016).

Discomfort and balance. A third challenge of flexible seating is discomfort and balance. Many studies (Bagatell et al., 2010; Schilling et al., 2003; Schilling & Schawartz, 2004; Umeda & Deitz, 2011) talked about issues around the way students had to sit on alternative seating. For example, fourth grade students with attention deficit hyperactivity disorder complained of back discomfort after using therapy balls in the classroom (Schilling et al., 2003). The reason half the kids complained was due to the lack of a backrest (Schilling et al., 2003). Schilling et al. (2003) said that one child in particular had to really work on her balance to even be able to use the

therapy ball, which was extremely challenging. For students who are used to moving in certain ways it would be difficult to start using underdeveloped muscles to balance on the balls.

In research by Umeda & Deitz (2011) one kindergarten student with autism spectrum disorder refused to use the therapy cushion at first. The only reason the child eventually complied was because the teacher taped a picture of a favorite character to the cushion (Umeda & Deitz, 2011). Having children refuse to use flexible seating is not a battle teachers want to face because of the focus on increasing instructional time. Umeda & Deitz (2011) went on to say that therapy balls demand an ability to balance that not all children have acquired yet. Core muscles must activate and remain alert, while also having at least one leg on the ground to balance on a therapy ball (Umeda & Deitz, 2011).

Comparably, Bagatell et al. (2010) noted difficulties with postural control in kindergarten and first graders with autism spectrum disorder. A third of the students were not able to use the therapy balls correctly because their vestibular-proprioceptive functioning was too weak (Bagatell et al., 2010). The students relied too much on backrests that their regular chairs provided (Bagatell et al., 2010). Schilling & Schwarz (2004) mentioned that preschool students with autism spectrum disorder had a hard time at first because they would bounce instead of sitting calmly and balanced. Working through this with students, especially those with special needs, would be tough for educators because it would most likely be a daily struggle that may or may not get better.

Incorrect use. Six studies reported concerns from teachers about students misusing flexible seating options such as therapy balls and disc ‘o’ sit cushions (Fedewa & Erwin, 2011; Matin et al., 2016; Seifert & Metz, 2017; Sorrell, 2019; Taipalus et al., 2016; Yi, 2019). Taipalus et al. (2016) noted worries from teachers that students would treat the therapy balls as toys

instead of seating options. Matin et al. (2016) also noted concerns of second through fourth grade students with autism spectrum disorder using flexible seating options as toys instead of seating.

Fedewa & Erwin (2011) said teachers reported that movement and fidgeting increased on therapy balls by their fourth and fifth graders with attention deficit hyperactivity concerns.

Therapy balls created a problem because students were sitting on them incorrectly, bouncing too much, and popping them (Sorrell, 2019). Sorrell (2019) also mentioned that anxious parents thought students would just play around on the therapy balls instead of doing work. Too much bouncing and moving would cause unnecessary distractions for the classroom.

Seifert & Metz (2017) talked about how preschool students used therapy cushions as toys instead of chairs in their study. Teachers pointed out that students were playing with the cushions and using them as surf boards at the beginning of the intervention (Seifert & Metz, 2017). These challenges are a huge reality that may appear without clear expectations and demonstrations of how to use these materials. Yi (2019) stressed how important communication about flexible seating is so students, parents, and other educators know what to expect.

Student Perceptions of Flexible Seating

Students have their own perceptions of flexible seating options. In a study by Sorrell (2019) there were no reported negative perceptions of flexible seating by any student interviewees. The common responses were about being comfortable, being able to move around, sitting near friends, and favorite seat types – therapy balls and wobble stools (Sorrell, 2019). Sorrell (2019) reported that students enjoyed their daily choices and the ability to move around without getting into trouble. More positive comments were presented in a study about fourth graders with attention deficit hyperactivity disorder using therapy balls. “You can keep your

brain active even when you're bored", "my posture improved", and "I can get my work done better" (Schilling et al., 2003).

Positive student perceptions of flexible seating were found in another study by Alicia Stapp (2018) that focused on fifth graders using disc 'o' sit cushions. The vast majority of students agreed that disc 'o' sit cushions were more comfortable than other seating in their classroom (Stapp, 2018). An overwhelming majority said sitting on this cushion helped increase their participation and engagement levels (Stapp, 2018). Another positive outcome was from a study on kindergarteners with autism spectrum disorder. Umeda & Deitz (2011) noted that one student chose to use the therapy cushion almost all the time.

Students preferred sitting on therapy balls over chairs and students stated that the therapy balls were more comfortable than chairs (Schilling et al., 2003; Taipalus et al., 2016). When given the choice of seating, students demonstrated a major preference for therapy balls (Taipalus et al., 2016). Similarly, Matin et al. (2017) noted that students preferred using therapy balls over air cushions or chairs. Preschoolers with autism spectrum disorder prefer therapy balls over other seating options in their classroom as well (Schilling & Schwartz, 2004). Furthermore, a study by Goodman et al. (2014) demonstrated student preference for therapy balls due to an increase in attention and motivation.

Teacher Perceptions of Flexible Seating

Teachers can create and provide the best learning environment when it comes to flexible seating when they know what other teachers, students, and parents think about flexible seating (Sorrell, 2019). There could be many factors that teachers consider when contemplating bringing this seating arrangement into their classroom. Sorrell (2019) noted that two of the three teachers

from her study implemented flexible seating for full-day use. Another option for flexible seating is letting students choose a seat for each subject throughout the day.

The overall perception of flexible seating by teachers from this study was positive, but they have advice for other teachers. Sorrell (2019) stated that the most important piece of advice from teachers for other teachers is to make expectations clear when implementing flexible seating in the classroom. Students need to know what to expect and how to use other seating options, especially if they have only ever used desks or tables with chairs. Another piece of advice is to learn as you go, which means to ask other teachers what works for them, do online research, add a little in at a time, and consider what your students enjoy (Sorrell, 2019). A third piece of advice from teachers to their peers is that flexible seating choices made by students helps the teacher get to know their students better (Sorrell, 2019). The decisions that students make throughout the day and actions they take project their personalities. Sorrell (2019) found that one teacher got to know her students better by seeing who they chose to sit by and how much they cared for one another.

A different teacher perception of a specific type of flexible seating was found. According to teachers in this study, therapy balls were neither helpful or harmful for third and fourth graders with attention deficit hyperactivity disorder (Taipalus et al., 2016). In fact, teachers reported that this type of flexible seating was difficult to use and was distracting to students (Taipalus et al., 2016). A new type of seating might take time for students to get used to and understand how to use properly.

Furthermore, Umeda & Deitz (2011) said that the teachers from their study want therapy cushions available in their classrooms because the cushions offer an alternate seating choice for all students. The results of this study showed no significant difference in using the therapy

cushion, but the teacher would like to have the option for future students. This was also true for the teacher in a study by Bagatell et al. (2010) because she requested therapy balls be available in her classroom although the study showed mixed results in improving student participation.

Teachers in a study by Schilling & Schwartz (2004) strongly supported the use of therapy balls in the classroom and wished to have therapy balls available for all students to use in the classroom. All teachers were also satisfied with the use of stability balls in their classrooms in a study by Fedewa & Erwin (2011). More teachers commented positively about the therapy cushions used in their preschool classrooms. They said things like “they just sat right down on them”, and “it seems to be working” Seifert & Metz (2017). Other positive comments from teachers related to therapy balls being used in a fourth-grade classroom with children with attention deficit hyperactivity disorders were found. Teachers reported that noise levels were lower, students were calmer and able to focus for longer periods of time, and that some student’s work production improved considerably (Schilling et al., 2003). These perceptions are crucial for other teachers to read about so they can make their own decisions about what to try in their own classrooms.

Parent Perceptions of Flexible Seating

Sorrell (2019) discovered that parents of students in classrooms with flexible seating options have mixed feelings towards it. While a few think flexible seating comes with a lack of structure and can be distracting, the majority of parents feel it is a great way to let students make decisions for themselves and move a little while learning (Sorrell, 2019). In a study by Fedewa et al. (2015) an overwhelming majority of parents allowed their second grader to participate in research that involved using therapy balls instead of chairs. This suggests that the majority of parents approved using flexible seating in their child’s classroom. Schilling & Schwartz (2004)

said that two sets of parents, in their small study of only four students, purchased therapy balls to use at home with their child due to the positive effects of using it in the classroom.

Autism Spectrum Disorder and Flexible Seating

Special education teachers, general education teachers, occupational therapists, and other professionals work together to meet the needs of all students. One thing does not necessarily work for every student. Many research studies have been done to try to increase participation, engagement, and positive appropriate behavior of students with autism spectrum disorder. (Bagatell et al., 2010; Matin et al., 2017; Schilling & Schwartz, 2004; and Umeda & Deitz, 2011) have all tested flexible seating options such as therapy balls or therapy air cushions in classrooms with children with autism.

Three studies found that therapy balls help boost behavior and engagement for students with autism (Bagatell et al., 2010; Matin et al., 2017; and Schilling & Schwartz, 2004). Bagatell et al. (2010) presented mixed findings that depended on the postural stability of the students. Having good control over muscles that assist with posture makes a difference when using therapy balls as chairs. Participation appeared to increase for at least one student with autism using a therapy ball instead of a chair (Bagatell et al., 2010). Matin et al. (2017) found that the overwhelming majority of students' in-seat behavior increased when using therapy balls. On-task behavior also increased significantly when students with autism sat on therapy balls instead of chairs (Matin et al., 2017). The third study which involved preschool students with autism using therapy balls by Schilling & Schwartz (2004) produced similar results. All of the students showed improvements in classroom behavior and an increase in engagement when using therapy balls as seating in the classroom (Schilling & Schwartz, 2004).

One study that included children with autism using therapy cushions by Umeda & Deitz (2011), however, did not conclude with increased behavior or engagement. This is, perhaps, demonstrating how diverse the needs are of children with autism spectrum disorder. No substantial changes were shown in the in-seat or on-task behavior of students using therapy cushions during their math activities (Umeda & Deitz, 2011).

In four separate studies of students with diverse needs (Bagatell et al., 2010; Fedewa & Erwin, 2011; Schilling & Schwartz, 2004; Seifert & Metz, 2017), researchers talked of the importance of occupational and/or physical therapists working closely with the classroom teacher to provide the best intervention possible. It is important for teachers and therapists to collaborate to determine how appropriate behaviors can be defined and measured (Bagatell et al., 2010). Fedewa & Erwin (2011) stated that consultants and school-based therapists should address interventions and their concerns up front with teachers. Effective strategies to support behavior, and improve engagement and performance, can be easily translated into the classroom with the help of therapists (Schilling & Schwartz, 2004; Seifert & Metz, 2017). All of this is imperative to helping students succeed. Educators and other professionals work together to make this happen by trying to provide the most comfortable and engaging atmosphere.

Attention Deficit Hyperactivity Disorder and Flexible Seating

When it comes to students with attention deficit hyperactivity disorder, the use of flexible seating to help improve behavior and on-task behavior provided mixed results. Two studies that used therapy balls as a flexible seating option (Fedewa & Erwin, 2011; Schilling et al., 2003) found an increase in focus and behavior. Both of these studies were done in a fourth-grade classroom. Fedewa & Erwin (2011) suggested that therapy balls could be used to successfully increase levels of attention and time on-task for students not only formally diagnosed with

attention deficit hyperactivity disorder, but also for those students who display similar symptoms. Using therapy balls as chairs can also be helpful for academic work that students do. All the students from the study of Schilling et al. (2003) demonstrated improved in-seat behavior and produced more schoolwork. This type of seating helped with handwriting because students could relax and move on the ball while working.

A third study of students with attention deficit hyperactivity disorder (Pfeiffer et al., 2008) used therapy cushions as their intervention and saw improvements in on-task behaviors. The study also looked at the students' ability to problem solve and self-regulate. Students who used the disc 'o' sit cushions showed improvements in cognitively self-managing tasks (Pfeiffer et al., 2008). Pfeiffer et al. (2008) also suggested that these disc 'o' sit cushions provide vestibular sensory input that some children with attention deficit hyperactivity concerns often require.

Another study that used therapy balls as an intervention for students with attention deficit hyperactivity concerns (Taipalus, 2016) found there was no significant difference in performance. This study not only tested the use of therapy balls to increase math fluency and reading comprehension, but also on-task behavior. Taipalus (2016) reported that therapy balls used as chairs had no effect on reading comprehension or math fluency scores, nor on-task behavior.

Once again, the research seems to show that the same intervention does not necessarily work for all students. All of these studies took place in second, third, fourth, or fifth grade rooms with children with attention deficit hyperactivity concerns. Therapy balls worked for some fourth and fifth graders, but not others. Disc 'o' sit cushions worked for third graders. Teachers need

the option of flexible seating in their classrooms to bring in as many types of chairs, balls, cushions, etc. to see what works best for their students.

Recommendations for Further Study

There are many opportunities for further study on flexible seating. Educators would benefit from multiple long-term studies of how flexible seating impacts the general education setting and its students. There are few studies that focus on the general education setting in elementary or early childhood classrooms. Teachers need data on the long-term academic, behavioral, engagement, and social benefits from these studies. It could help them set up their students for greater success.

Another option for further study on flexible seating would be about students transitioning to their next class. Research on flexible seating lacks the information on how students go to their next classroom that may or may not have flexible seating options. Educators need to know how students process this transition, as well as how it effects their behavior and education. It would be beneficial to know the impacts of students going from having flexible seating to not having it, but also the other way around. Collecting data on having flexible seating in the classroom multiple years in a row would also be helpful.

Something else to consider for future studies is using flexible seating in older grades. For example, middle school, high school, or even college settings. Data showing academic, social, and behavioral outcomes could provide structure for how these schools are run and may need to change in the future. Middle and high schools, and college, often include students moving to multiple classrooms in one day, so further study about flexible seating needs to show where it fits into that kind of schedule.

Perhaps the most important topic of further study regarding flexible seating is implementation. Teachers need to see research on what works best for each grade level and each type of seating. Teachers also need to know what to avoid in these same situations. There is a huge amount of opportunities for study on this because of the multitude of types of flexible seating! Each type of seating would need many studies to provide the best data for teachers on how best to implement it in their own classrooms.

Conclusion

It is evident from this literature review that flexible seating is a trend that more educators need to consider. Students with special needs benefit from using therapy balls or inflatable cushions because their sensory needs are met, which means they are able to focus better on tasks. Student choice has a huge roll, and it is clear that students prefer flexible seating over traditional seating. More research is needed to find out the long-term academic, behavioral, and social effects flexible seating has on students. Teachers need as much information as possible available to use in their classrooms so they can meet the needs of their students.

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