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## The Use of Flexible Seating in the Elementary Classroom

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The Use of Flexible Seating in the Elementary Classroom

by

Pamela Erin Swofford

August 12, 2021

A Dissertation submitted to the Education Faculty of Lindenwood University in

partial fulfillment of the requirements for the degree of

Doctor of Education

School of Education

The Use of Flexible Seating in the Elementary Classroom

by

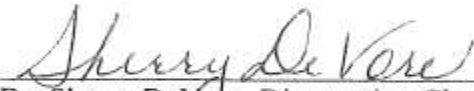
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This Dissertation has been approved in partial fulfillment

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Doctor of Education

Lindenwood University, School of Education

  
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Date

Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

Full Legal Name: Pamela Erin Swofford

Signature: Pamela Erin Swofford Date: 8/12/2021

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I also want to thank my children for their continued support and love throughout this journey. I hope this process has shown each one of my children and grandchildren to never quit on their dreams, to not give up even when it is hard, and that they can do whatever they set their minds to.

I owe gratitude to my parents, James and Alice Ann. They instilled in me at a young age to strive to be the best person I can be, to have determination, to set goals for myself, and that hard work will take you far.

I am eternally grateful for a loving God who has taught me through this process to lean into him, and He will give me the desires of my heart – Psalm 37:4.

## **Abstract**

The purpose of this study was to examine the use of flexible seating in southwest Missouri classrooms. Four research questions guided the study based on the conceptual framework of Eric Jensen. The work of Jensen (2005) was selected as the conceptual framework due to his focus on the use of movement and how it impacts the brain. The research population consisted of 119 school districts from 25 counties in southwest Missouri. Participants in the study included elementary principals and classroom teachers in the first through fourth grades. Of the participants, 107 teachers completed a survey specific to the use of flexible seating. Principals were asked to provide data from third-grade classrooms, which included DRA scores from fall, winter, and spring assessments and behavior incident referrals for the school year. The principals also identified the classrooms as utilizing either flexible seating or traditional seating. Survey results indicated overwhelming support for flexible seating, and participants expressed the belief that flexible seating benefits all students academically and behaviorally and is beneficial for students with sensory concerns. The DRA data and behavior incident referrals were compared using a *t*-distribution chart to determine if any statistical differences existed between flexible seating classrooms and traditional seating classrooms. The individual school data did not reveal a significant difference between flexible seating classrooms and traditional seating classrooms.

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## **Chapter One: Introduction**

Classrooms of the 21st century are changing (Walker, 2016). Collaborative, student-centered classrooms are evolving traditional pedagogy (Zimmerman, 2019). Educators are becoming more interested in flexible seating, and researchers have established that the design of a classroom influences a child's engagement, participation, and overall learning experience (Healy, 2017). Yoga balls, stand-up tables, couches, bean bags, and wobble seats can be integrated to enhance learning experiences and improve concentration by allowing students to sit where they feel comfortable (Walker, 2016).

Flexible classroom environments allow for independent as well as group work (Zimmerman, 2019). Traditional seating does not allow for the natural movement of a child, while flexible seating increases sensory input and leads to improved behavior and overall academic performance (Stapp, 2018). Fidgeting may result from students sitting at desks for long periods of time with decreased lack of exertion (Stapp, 2018). Floor sitting with cushions and mats increases focus and decreases fidgeting (Zimmerman, 2019).

Collaborative environments are being redesigned to accommodate learning more flexibly (Zimmerman, 2019). The use of flexible seating indicates consideration of a child's learning needs, and classrooms should be customized to each child to foster a positive learning environment (Zimmerman, 2019). The positive effects of non-traditional seating can be seen in many classrooms and throughout education (Jimenez, 2016). Simply permitting students to have movement in the classroom instead of sitting in hard chairs all day allows the brain to function more effectively (Jimenez, 2016). When students are moving, they are able to retain more information than when they are

sedentary (Jimenez, 2016). Movement enlists all sensory organs, thereby increasing engagement and enhancing learning (Wilson, 2014).

### **Background of the Study**

The transition from traditional classroom seating to alternative or flexible seating should be considered for students who need more than just rows of desks to learn effectively (Walker, 2016). Ketcham and Burgoyne (2015) contended that when substituting therapy balls for chairs, on-task behaviors increase, along with cognitive functioning and sensory input. Schilling and Schwartz (2004) asserted that when students use therapy balls, their behaviors improve, and on-task time increases.

Flexible seating in classrooms is a movement by educators to address the needs of all students to learn in different ways and different environments; while some children can sit in traditional desks and chairs, many cannot (Kennedy, 2016). The use of different forms of seating allows students to have movement and to be more comfortable when learning, especially when 80% of their day is seated (“Student Seating is on the Move,” 2016). Doing away with traditional seating fosters active seating, facilitates group work, and encourages movement (Kennedy, 2016). Examples of flexible seating include wobbly chairs, wobble cushions, exercise balls, beanbag chairs, and standing desks (Kennedy, 2016). These help students address their need for movement, especially those with attention deficit hyperactivity disorder (ADHD) and autism who benefit from sensory activities (Kennedy, 2016).

Zimmerman (2019) stated, “Flexible seating arrangement is a key part of this new, modern learning environment” (p. 2). Consideration of the classroom environment is an innovative concept and has only been addressed since the 20th century (Roskos &

Neuman, 2011). Traditionally, educators placed desks and chairs in rows and focused on purpose and functionality (Roskos & Neuman, 2011). Recognizing that students' needs change, educators adapt and address those needs and focus on increased learning and not just teacher convenience (Kennedy, 2015).

A child's environment is imperative in his or her day-to-day learning, and where environments are encouraging communication, higher-level thinking, and collaboration among students (Delzer, 2016). Environments that are flexible foster independent and group work (Zimmerman, 2019). According to Kennedy (2016), different seating opportunities encourage movement. Kennedy (2016) considered:

Movability and maneuverability of seating are valued by 21st-century students because it facilitates the ability to work in groups or teams, which is becoming more common within the classroom, when seating configurations need to be altered within class, students may expect inherently that the classroom environment, especially seating, will be moldable to the task or purpose at hand. (p. 20)

Movement increases cognition, focus, and recall (Shammas, 2019).

### **Conceptual Framework**

Jensen's (2005) brain-based research was selected to guide this study. This framework was appropriate because a student's brain is influenced and altered by the environment around it, along with physical, social, and emotional influences (Jensen, 2005). Individual learning styles are impacted by brain-based learning (Bonomo, 2017). Jensen (2005) discussed the importance of how the brain affects learning and is inclined

to environmental influences. Movement has a developmental impact on students, as well as a physiological effect (Wilson, 2014).

Jensen (2005) concentrated on brain-based research and how the brain is constantly changing and affected by one's environment; the brain is an adaptable organism. The focus of Jensen's (2005) research includes how sensory processing is a major component in a child's learning, the importance of the vestibular system, and how the inner ear controls movement and balance. When there is movement or exercise, an increase in brain tissue results (Medina, 2014). Wilson (2014) asserted behavior is improved with exercise or movement during the school day, and this movement decreases off-task behavior and can improve learning. Fewer disruptive behaviors occur when children are active (Medina, 2014).

Jensen (2005) understood the vestibular system and how lack of development through stimulation can lead to learning problems. Movement helps students relieve stress and develop the ability to pay attention to the task at hand (Abdelbary, 2017). Jensen (2005) also stated increased reading and writing scores, improved attention, and better listening skills develop as a result of early motor stimulation.

According to Jensen (2005), a strong connection exists between movement and learning; movement can impact all students by increasing blood flow to the brain, activating emotions, and increasing concentration and recall. This is extremely beneficial for all students, especially struggling learners, students with special needs, and even students with dyslexia (Jensen, 2005). Students who are active isolate stimuli more effectively and can focus more when compared to peers who are not active (Medina, 2014).



Jensen (2005) examined how the brain is affected by its environment; when a child is in a comfortable and pragmatic learning environment, learning increases, and stress levels decrease. Bonomo (2017) agreed that learning is increased when the environment includes a variety of stimuli. In his research, Jensen (2005) discussed how the environment is a variable some teachers can augment to make it more advantageous to learning.

Ketcham and Burgoyne (2015) believed there are many benefits for students in classrooms with flexible seating compared to traditional seating, including increased focus, improved academic performance, and an increase in on-task behaviors. By incorporating a stimulus focused on sensory processing and engaging the brain, students demonstrate positive performance in the classroom (Ketcham & Burgoyne, 2015). Likewise, Jensen (2005) determined that the physical environment can positively influence performance academically, socially, and behaviorally.

### **Statement of the Problem**

One of the obstacles educators face in deciding whether to implement flexible seating is that the research is limited and lacking (Zimmerman, 2019). Merrill (2018) suggested the scarcity is due to the lack of research on children in the classroom and how flexible seating affects them in the school environment. Zimmerman (2019) noted few studies regarding flexible classroom design and its impact on the learning and engagement of students. There is a need for research related to flexible seating and its effects on behavior and academics in the classroom (Wright, 2020). The research on flexible seating is limited even within available research on classroom environments (Merrill, 2018).

One reason there is limited research available regarding flexible seating is that the environment is fluid in the classroom (Merrill, 2018). The classroom environment is complex and is not only a place for academics; it involves space, air, lighting, and seating (Merrill, 2018). With many changes in education, one area that has not altered is the environment and the seating requirements imposed on children (Jimenez, 2016).

Zimmerman (2019) suggested there is limited research available on how flexible seating is becoming helpful to learners in this century. Similarly, Fehlandt (2017) determined with the vast research available; there is little regarding the environment and how the environment links to modern instruction. Educators should examine the research on designing learning spaces, since it is not a trend (Konrad, 2020).

Negiloni et al. (2019) supported the need to understand a student's environment since one-third of the school day is spent in the classroom (para. 6). Students can be active and can focus longer when they have the ability to move slightly (Abdelbary, 2017). Simultaneously, the environment needs to match the comfort levels of both the teacher and students (Paterson, 2019). Flexible spaces alter the learning environment, and pedagogy must be transformed to achieve the desired effect (Merrill, 2018). The design of a classroom has been debated for many years; overall, the esthetics must match the educators using it every day (Paterson, 2019).

### **Purpose of the Study**

The purpose of this study was to examine flexible seating and whether the use of flexible seating in the classroom environment increases student reading scores and decreases discipline referrals. Wilson (2014) determined a correlation between movement and learning; when there is movement, there is an increase in performance academically.

Jimenez (2016) stated that children are often expected to sit for extended periods of time at rigid, hard desks, which can lead to health problems. Seating arrangements influence the students' outlook toward their education, as well as the overall classroom climate (Gremmen et al., 2016).

The study involved gathering data from principals and classroom teachers regarding their experiences with flexible seating and its impact on student learning and behavior. Regular education and special education teachers in first through fourth grades and elementary principals were asked to explain their use of flexible seating and their beliefs in its effectiveness in the classroom. Third-grade student scores on the Developmental Reading Assessment (DRA) were compared to identify differences between traditional seating and flexible seating classrooms. In addition, third-grade student discipline referrals were examined to identify differences between classrooms utilizing traditional and flexible seating.

### ***Research Questions and Hypotheses***

The following research questions and hypotheses guided the study:

1. How is flexible seating utilized within first through fourth grades in southwest Missouri?
2. What perceived academic, behavioral, and sensory benefits do elementary teachers and principals report as a result of implementing flexible seating in the traditional seating classroom and special education classroom?
3. What difference, if any, exists between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating?

*H3<sub>o</sub>*: There is no difference between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

*H3<sub>a</sub>*: There is a statistically significant difference between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

4. What difference, if any, exists between the number of discipline referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating?

*H4<sub>o</sub>*: There is no difference between the number of discipline referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

*H4<sub>a</sub>*: There is a statistically significant difference between the number of discipline referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

### **Significance of the Study**

According to Jimenez (2016), active learning increases when the classroom environment incorporates activity and includes flexible seating instead of sedentary seating. The objective of a flexibly designed classroom is to give students control over their learning while enhancing a student-centered approach (Burgeson, 2017). Schilling and Schwartz (2004) suggested students benefit from flexible seating as compared to regular seating in classrooms and specified, "Sensory modulation strategies can provide the central nervous system with the type of sensory stimuli that bodies require to attain

and maintain an optimal state of arousal for learning” (p. 424). School district leaders who are changing their selection and classroom design of furniture are working to accommodate flexibility in learning spaces (Kennedy, 2015). This study may serve to clarify if flexible seating is a worthwhile investment for teachers and school districts.

Teachers considering flexible seating as an option are examining a multitude of seating arrangements, including couches, pillows, bean bags, ball seats, and standing tables (Peterson, 2019). According to Jimenez (2016), the variety of classroom styles helps teachers engage with students in different learning positions besides standard desks. Teachers are also considering the cost associated with making the change to a flexible seating environment, and according to Raposa (2017), teachers are often paying out of their own pockets to implement flexible seating. Healy (2017) determined flexible seating costs can be excessive. By surveying elementary teachers and elementary principals, the findings from this study may inform school district leaders about how flexible seating can be implemented and funded.

School districts are examining the evolution in learning environments and ways to accommodate a changing world where academics can be impacted by a student’s learning environment (Jimenez, 2016). Merritt (2014) noted unanswered questions regarding the use of an alternative seating style and any correlation with learning. Overall, Merritt (2014) suggested there is not adequate research on the use of flexible seating and learning. As a result of this study, principals and teachers will have current information to make informed decisions about whether or not to implement flexible seating to improve learning and to increase academic scores.

The findings from this study may provide information to teachers and school district leaders regarding how changes in a classroom environment can impact a student's behavior. Merritt (2014) argued an increased burden on teachers to support student learning, and if there is not something addressed to assist children with difficulty focusing, those issues will continue to occur. This research will add to the body of available research regarding a connection between behavior and flexible seating. There is limited information available regarding whether flexible seating improves a student's behavior and the connection that exists between the two (Merritt, 2014).

### **Definition of Key Terms**

The following key terms are defined:

#### ***Developmental Reading Assessment (DRA)***

The DRA is an individually administered assessment of a child's reading ability (Scholastic, 1998).

#### ***Flexible Seating***

Flexible seating is an alternative to traditional desks and chairs that incorporates comfort and flexible space consisting of standing tables, stability balls, crate seats, bean bag chairs, and couches (Kennedy, 2016).

### **Limitations and Assumptions**

The following limitations were identified in this study:

1. Not all students were in classrooms with flexible seating at the time of the study; those classrooms were configured using traditional seating.

2. Not all schools included in this study implemented the same models of flexible seating. Students may have been exposed to different flexible seating options and methods.

3. The sample and demographics were limited to elementary schools in southwest Missouri.

4. The survey was created by the researcher, which may be considered a limitation.

The following assumptions were accepted:

1. The responses of the participants were offered honestly and willingly.

2. The sample was representative of the general population of educators who held teaching certificates from the MODESE.

## **Summary**

Students need to be actively engaged in their learning (Kilbourne et al., 2017). Flexible seating is a model of classroom structure implemented to increase student concentration, academic performance, and on-task behaviors (Walker, 2016). Flexible seating has been described as coffeehouse-style seating to encourage flexibility and engagement (Walker, 2016). Students are impacted by their environment, and the environment can influence their performance academically (Jensen, 2005). Their learning is also impacted by the development of the sensory-motor system, which has been shown to increase and expand success academically (Jensen, 2005). The vestibular system manages the brain's ability to gather information and process feedback (Jensen, 2005).

Flexible seating includes multiple configurations and uses that can increase a child's opportunity to move (Abdelbary, 2017). Jensen (2005) supported the need for

movement and highlighted how the environment impacts learning. Students who move and have a more active learning environment will likely realize an increase in memory, improved clarity, and an increase in cognitive processing skills (Abdelbary, 2017). Even something as simple as standing can increase blood flow and heart rate, which in turn, will impact learning (Jensen, 2005).

In this chapter, the background of the study and conceptual framework were provided to establish the relevance of flexible seating and its impact on the learning environment, as well as the impact of flexible seating as it relates to a student's need to move. Next, the statement of the problem and purpose of the study were presented. Following this, the research questions, significance of the study, and key terms were addressed, along with limitations and assumptions.

In Chapter Two, current literature is reviewed to examine the use of flexible seating in classrooms. The chapter begins with a focus on topics including types of seating, the environment, sensory effects of flexible seating, and the effects of flexible seating on student learning. Then, the benefits and barriers of flexible seating for students with special needs and behavioral disorders are discussed.

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## Chapter Two: Review of Literature

The review of literature was conducted to provide insight into the use of flexible seating and its effectiveness for schools. Flexible seating is a physical environment that takes into consideration group work, as well as allowing for independent work and can consist of alternative chairs, desks, and cushions (Zimmerman, 2019). The study was developed by examining the following main topics pertaining to flexible seating: environment, sensory needs, student learning, behavior, and students with special needs.

Kilbourne et al. (2017) found a relationship among the environment, classroom design and furnishings, and learning. The layout of the flexible seating classroom encourages an active pedagogy that increases on-task behaviors (Kilbourne et al., 2017). Most schools have evolved in an effort to educate students effectively and want students to be active learners in environments conducive to meeting individual needs (Kennedy, 2015).

Traditionally, educators utilized desks and chairs in rows and focused on purpose and functionality (Roskos & Neuman, 2011). Classroom environments need to be adapted to accommodate shifts in learning styles (Kennedy, 2015). Lippman (2015) asserted the physical environment and classroom design should be developed with the idea of collaboration in mind.

### Conceptual Framework

The conceptual framework for this study was based on brain-based learning and the work of Jensen (2005). Jensen (2005), author of *Teaching with the Brain in Mind*, argued the brain is always changing, and the environment shapes the brain. Researchers of brain-based learning have shown that movement impacts learning by increasing

attention, reducing behavior, and improving attention spans (Blackmer, 2018). Wilson (2014) discussed regular movement is key to maintaining brain health. Jensen (2005) also stated, “Teachers know engaged students are usually happier than disconnected ones who have isolated tasks to do, and research confirms that engagement activates more of the pleasure structures in the brain than do tasks of simple memorization” (p. 35). Jensen (2005) emphasized a learner’s brain is molded by interacting with the environment.

Vygotsky’s theory of proximal development suggested students gather information in relation to their environment (Lippman, 2015). Therefore, classroom designs are strategic to student engagement and overall learning experiences (Healy, 2017). Patrick (2015) concluded that when students are moving on therapy balls, an increase in attention to classwork and focus on assignments results. Lippman (2015) observed, “Vygotsky’s theory acknowledges learners are transformed by their transactions with social and physical environments” (p. 40).

The brain needs information in intervals with time to process (Jensen, 2000). The body and brain take in information and use the seven senses to process it (Merritt, 2014). Physical activity helps learners not only with their health but with the process of learning (Guseva & Solomonovich, 2017). According to Jensen (2000), “Sitting can create fatigue, which is bad for learning. Students may seem restless and unable to concentrate—or worse they may become undisciplined—when the real problem is bad ergonomics and lack of movement” (p. 35). Jensen (2000) stated:

Active learning has significant advantages over sedentary learning. The advantages include learning in a way that is longer lasting, better remembered, more fun, age-appropriate, and intelligence independent and that reaches more

kinds of learners. Active learning is not just for physical education teachers; that notion is outdated. Active learning is for educators who understand the science behind the learning. . . . There needs to be a stronger blend of sitting and moving. (p. 37)

Merritt (2014) concluded that alternative seating increases student focus and will make learning more effective in all academic areas.

Medina (2014) supported the idea that students perform better in terms of academic achievement when exercise and movement are incorporated into the daily school routine, specifically by increasing scores in language and reading. Brains were built for movement, and movement improves thinking (Medina, 2014). This movement encourages blood flow to the brain and promotes glucose production and energy, which in turn, connects neurons (Medina, 2014). Movement increases blood flow, which increases the oxygen levels in the brain, thereby impacting memory and recall (Blackmer, 2018).

### **Flexible Seating Overview**

For the purpose of this study, flexible seating was defined as an alternative to traditional desks and chairs (Kennedy, 2016). Flexible seating consists of standing tables, stability balls, crate seats, bean bag chairs, and couches (Kennedy, 2016). To fully comprehend flexible seating, one must examine how flexible seating compares to traditional seating. According to Paterson (2019):

Flexible seating can range from just allowing students to choose their seats or move around the classroom more frequently to elaborately planned rooms with a wide range of seating options that allow students to choose to work at different

heights and in different positions. Furniture options include couches, floor pillows, mats, bean bag chairs, yoga ball seats, stools, low tables, standing work surfaces, and traditional chair and desk combinations. (p. 2)

Flexible seating allows students the ability to move in the classroom when working, which increases overall productivity and student participation (Zimmerman, 2019).

Zimmerman (2019) described flexible seating alternatives as shown in Table 1.

**Table 1**

*Types of Flexible Seating*

Solutions	Description
Unconventional chairs	Adding contemporary seating such as beanbag chairs, scoop chairs, or exercise balls makes it easy for students to move around the classroom. These chairs are also good for both individual and group work and give students more freedom and comfort than a traditional desk chair.
Adjustable standing desks	Standing desks, such as Ergotron’s LearnFit, allow students to control their work environment to fit their needs at any given time.
Cushions and mats	Sitting at a desk all day can be distracting for students who have trouble staying still. Floor seating can keep students focused on their work instead of trying not to fidget.

*Note.* Types of flexible seating. Adapted from “How K–12 Schools Can Create Flexible Seating in the Classroom,” by E. Zimmerman, 2019, p. 2. Copyright 2019 by EdTech Focus on K–12.

Mehrbach and Beingessner (2018) acknowledged that flexible learning environments are more than furniture and physical floor plans; modern environments address other elements. Schools are becoming more intentional with physical space design and learning opportunities (Casper, 2019). Flexible learning environments encompass choice, physical health, comfort, a sense of community, collaboration, learning commitment, communication, sensory input, and mindset shift (Wagoner, 2018).

### **Environment**

The physical environment plays an important role in learning (Stapp, 2018). Casper (2019) discussed why flexible learning environments are beneficial; they redefine space, promote collaboration, encourage flexible time and grouping, and support personalized learning. Typical classroom seating can be unhealthy for students' backs (Schilling & Schwartz, 2004).

According to Kennedy (2016), when there are different seating opportunities, movement is encouraged. Kennedy (2016) emphasized the ability of 21st-century students to move and maneuver seating aids in working in teams or groups and making the environment more conducive to learning. Similarly, Burgeson (2017) suggested there has been a change to classrooms to promote collaboration and engagement.

Classrooms should be environments that enable collaboration, creativity, critical thinking, and communication, which is not a possibility when students are at desks all day (Delzer, 2016). Flexible seating encourages student engagement, helping students focus on the task at hand (Wright, 2020). Kariippanon et al. (2019) emphasized that flexible learning spaces encourage collaboration and engagement.

Roskos and Neuman (2011) indicated, “The classroom environment can work for us or against us, which is why it is first, last and always among pedagogical concerns” (p. 110). In addition, Roskos and Neuman (2011) continued, “A fundamental of design is to link the environment to the purpose. The reason is too well documented empirically; the amount, arrangement and organization of physical space influence human behavior” (p. 111). By incorporating seating that is easily moved, such as wobble chairs and tables, the classroom evolves into a flexible space—timeless, creative, and enterprising (Gonzales & Young, 2015).

Kennedy (2015) revealed that when classroom designs are discussed, the move toward flexibility in furniture should be considered. Sheniger and Murray (2017) emphasized the importance of learning environments that focus on physical space. Classroom design should encourage multiple learning styles (Kennedy, 2015).

Kennedy (2015) found that undesirable classrooms are characterized by furniture attached to the floor and unable to be moved. Hinckson et al. (2016) discussed environmental changes, including the use of adjustable or standing workstations and desks, chairs, bean bag chairs, mats, and exercise balls. Being creative in the design of the classroom, not only in libraries and technology rooms, can promote a personal learning space tailored to the child’s need for more supportive collaboration and social connections (Gonzales & Young, 2015).

The physical environment is changed by allowing students control over where they sit (Burgeson, 2017). Romina (2014) maintained a classroom conducive to the physical environment stimulates a student’s intellectual ability and is an important factor in strengthening educational growth. Lippman (2015) found that to implement a fluid

learning space, settings must be differentiated, and the environment must include areas supportive of individual, one-to-one, and small group incorporations.

The learning environment is one area identified as having an impact on student learning (Romina, 2014). Zimmerman (2019) stated that rigid classrooms do not meet the needs of today's learners, whereas a free-flowing environment allows for a customizable learning experience. A positive environment augments achievement and academic success (Massey et al., 2016). Asiyai (2014) discovered:

One of the factors that have been identified as having a serious impact on students' learning is the learning environment. For students to learn effectively and meaningfully, their perception about their classroom physical condition matters a lot. The impression students have about the condition of their classroom physical learning environment affects their academic achievement, their attitude towards learning and schooling. (p. 718)

Roskos and Neuman (2011) noted the social environment affects the classroom environment and promotes the individual's literacy experience.

According to Kennedy (2015), strategies have changed to educate students more effectively because the majority of schools and universities want their students to be active learners instead of passive beneficiaries of information from teachers. Kennedy (2015) also suggested educational institutions need to provide environments that give students a place to learn; educators need to be open to providing different environments to address the strengths and diversity of learners. Hancock and Carter (2016) reported flexible spaces enable students to be in control of their learning and allows teachers to

encourage students to be involved in group work. Lisa (2019) discussed the pros and cons of using flexible seating to meet the needs of individual student learners (see Table 2).



**Table 2***Pros and Cons of Flexible Seating*

Pros	Cons
A switch to student-centered learning in an alternative classroom shifts some control of the class from the teacher to the students, which can foster an increased sense of responsibility among students.	One of the main reasons the old school classroom never went out of vogue is because it is cost efficient – the same cannot always be said for Starbucks classrooms. According to the NEA Today, making over a traditional classroom can be pricey, just like a cup of Starbucks coffee.
The simple act of letting student choose the seat they prefer instead of having their desk assigned to them can empower them and give them a sense of ownership.	By suggesting an alternative classroom design, you’ll be challenging ingrained ideas hardwired into educators and students alike over the course of generations. Teachers are likely to face skepticism from parents who are set in their ways, as well as resistance from administrators and fellow teachers.
The Starbucks classroom layout can reduce the frustration, resentment, and sheer boredom often experienced by students when they are relegated to a single chair in a single space for an extended period of time.	There will be a learning curve for the teacher, who must get acclimated to the new framework, just like the students.
Just as in coffee shops, alternative seating places kids not in long, even rows, but in small clusters designed to let them face and engage with others. This can improve socialization and inter-student communication.	Teachers will be required to surrender some power and control, which is likely to be counter-intuitive for an educator but necessary for an alternative classroom to work.
The orderly, sterile, and often quiet environment of the traditional classroom does little to prepare children for the distractions of adulthood, but evidence shows that a flowing, busy, alternative classroom just might.	Kids are still kids, and without assigned seating, some friction over who sits where is inevitable, especially in the beginning.
Alternative seating encourages self-direction among students and, perhaps most importantly, frees teachers from spending so much managing and controlling students who feel trapped in rigid seating patterns.	Alternative classrooms can be noisier and appear chaotic, and students who are naturally more solitary might have difficulty adjusting.

*Note.* Pros and cons of the use of flexible seating. Adapted from “Reimagining the

Classroom Environment: Alternative Seating and New Approaches to Classroom Design,”

by A. Lisa, 2019. Copyright 2019 by Community for Accredited Online Schools.

Burgeson (2017) explained students in a non-traditional seated classroom have a higher level of engagement. Handwriting, organization, and understanding of material improve when sitting on stability balls as opposed to chairs (Al-Eisa et al., 2013). Benes et al. (2016) found movement in classrooms increases student engagement in academics.

Massey et al. (2016) declared that when exercise balls are used in the classroom, learning-performance; the ability to concentrate on reading, writing, and mathematics; and on-task behavior are increased. Allowing students to be active helps them stay focused longer and releases energy, which allows them to pay attention for longer periods and leads to increased engagement and comprehension of work (Massey et al., 2016). Logue (2016) revealed alternative seating can provide movement some learners need, helping them stay focused on tasks.

Creating an environment centered around the learner impacts a classroom, thus helping students control their thinking and learning (Gonzales & Young, 2015). When students can move in a classroom, engagement increases, and they can anchor new information and experience into neural networks (Hannaford, 2005). Gonzales and Young (2015) stated, “The greater understanding of effective instructional practices in relation to the redesign of learning spaces is beginning to take shape across the nation, and beyond” (p. 28).

Healy (2017) noted the design of the classroom is important to how children engage with each other, stay involved, and contribute to the learning environment. An optimal environment of increased performance is essential for students to learn and improve behavior (Jensen, 2005). In a 2016 Steelcase Education Study, Healy (2017) found classrooms set up to increase engagement and learning encourage participation

more than traditional seating classrooms. Klein (2016) emphasized when students are allowed to learn in an environment that is brain-friendly, there is collaboration and movement in an integrated classroom.

### **Sensory Needs**

Wagoner (2018) stated, “Flexible seating stimulates a students’ sense of touch” (p. 4). According to Ketcham and Burgoyne (2015), the learning process is influenced by sensory processing. The human brain processes information in tactile sensory areas at 30 million bits per second, tracking how one feels and what the environment feels like (Jensen, 2005, p. 1). Ketcham and Burgoyne (2015) established when students were seated on standard chairs, on-task behavior was at 50%; when students were using therapy balls, on-task behavior was at 85% (p. 42). The use of therapy balls encourages rocking and bouncing, which helps students engage and use the vestibular system (Ketcham & Burgoyne, 2015).

According to Ketcham and Burgoyne (2015), activities needed to increase sensory processing in the proprioceptive and vestibular input systems have led many schools to change from chairs to therapy balls. When therapy balls are used instead of standard chairs, sensory stimulation and on-task behavior increases (Ketcham & Burgoyne, 2015). Students with sensory needs benefit from bouncing on exercise balls (Minero & Fleming, 2020). Schilling and Schwartz (2004) discussed how strategies to increase sensory modulation help the central nervous system with sensory stimuli, which supports the body as it becomes ready for learning.

The use of therapy balls can help students move and be active while increasing a productive posture (Schilling & Schwartz, 2004). Massey et al. (2016) related the use of

exercise balls in classrooms improves behavior and focus and increases academic achievement for students with autism spectrum disorders (ASD) and students with ADHD. By using therapy balls, students can address their personal needs and sensory deficits (Massey et al., 2016).

Jensen (2005) discussed the performance of a learner is improved by chairs designed effectively. In a study by the California Department of Education (2020), the following was disclosed:

Children have a developmental need for movement, and flexible school furniture allows students to shift position, rock, rotate, and roll. Chairs and tables with wheels and adjustable standing desks offer students the choice of sitting or standing during the school day and provide alternatives for various activities, learning styles, and special needs. (p. 2)

The motor and sensory areas of the brain work together in the sensory-motor system; the brain takes in information and controls the activities associated with the visual, motor, and auditory systems (Jensen, 2005).

Sensory integration affects learning in a positive way by stimulating the senses (Medina, 2014). A child's development of motor skills is influenced by the sensory environment, including the following: touch, movement, sound, sight, pressure, taste, and smell (Kelley, 2015). Kelley (2015) suggested considering the following when establishing a sensory-friendly environment to enhance learning and allow a child to feel safe: lighting, color, seating, noise, environment organization, and sensory retreat (see Appendix A).

## **Student Learning**

Sorrell (2019) stated:

Using flexible seating gives students the chance to move around more in their seats, whether that involves swiveling on a wobble stool or lightly bouncing and rolling on a therapy ball. . . . It is believed that there are nine different intelligences that people relate to and learn from, which is called the Theory of Multiple Intelligences. We are all born with a mix of the intelligences, possibly including bodily-kinesthetic. (p. 121)

Tamilselvi and Geetha (2015) determined students learn and focus more when allowed to move, which can be from walking or simply moving around the classroom. Flexible seating allows kinesthetic movements that benefit students (Tamilselvi & Geetha, 2015).

Delzer (2016) suggested students learn best when there is movement, as well as an improvement in academic performance and behavior.

Student learning is impacted when seating arrangements are flexible, and there is an increase in engagement and learning (Fisher et al., 2021). By changing a learning environment, a child's potential and learning are impacted (Gonzales & Young, 2015). Sir Ken Robinson, in a 2015 TED Talk, discussed the need to change not only instructional approaches but environments to address a child's individuality, curiosity, and creativity (Robinson & Aronica, 2015). Flexible seating fosters a more collaborative learning environment that increases engagement (Burgeson, 2017).

The landscape of a classroom can lead to more inclusive education, and teachers need to address varied needs to provide learning opportunities (Navarro et al., 2016). According to Fisher et al. (2021), there are many benefits to an environment that

incorporates flexible seating. The environment plays a role in student performance (Gonzales & Young, 2015).

According to Abdelbary (2017) and a 2011 study by Duke University, student concentration in the classroom is the best indicator of academic success, especially when combined with at least 60 minutes of physical activity per day (para. 6). Classroom design can make a 25% impact either positively or negatively over the course of a child's academic school year (Gonzalez & Young, 2015, p. 10). When a student's environment is not a barrier to on-task behavior, instructional time increases (Halm, 2015). According to the California Department of Education (2020), "Collaborative learning spaces call for flexible furniture to allow versatility and modifiability. Classrooms designed to support active learning increase student engagement on multiple measures, as compared to traditional row-by-column classroom seating" (p. 2).

The learning environment is imperative to successful growth and learning (Asiyai, 2014). When students are on task and engaged in their learning, instructional time and academic achievement are increased (Halm, 2015). Physical movement promotes balance, social skills, physical development, and cognitive development (Abdelbary 2017). According to Asiyai (2014), the classroom environment enhances a student's educational results, along with characteristics, such as aesthetics, both emotional and physical, which are a huge influence on learning. Academic success is affected by the child's learning environment (Asiyai, 2014).

The physical environment should be designed to improve and foster a positive learning experience (Lippman, 2015). According to Schilling and Schwartz (2004), there is a program in Switzerland based on the use of therapy balls, and students can focus

more on classroom events when seated on the balls. Jensen (2005) determined, “Learning should have active components to it” (p. 148). When students are allowed to use flexible seating, they are staying active and are able to focus more on learning because they are moving and releasing energy (Massey et al., 2016). Andrade (2018) stated, “In these flexible spaces, teachers come out from behind their desks and engage with students, who, in turn, are more energetic and enthusiastic about learning in this futuristic, interactive, collaborative space” (p. 3).

The University of Minnesota conducted quasi-experimental research comparing traditional learning spaces with active learning classrooms (Brooks, 2012). This study was modeled on a previous study that established that student learning is enhanced in a flexible learning environment (Brooks, 2012). Flexible classrooms impact educational outcomes more than do traditional classroom designs (Merrill, 2018). Brooks (2012) compared the traditional classroom with an active learning classroom environment regarding classroom activity, delivery method, the instructor, and the students. A statistical difference occurred in the area of class discussions—48% more in the active learning environment compared to the traditional classroom (Brooks, 2012, p. 5) (see Table 3).

**Table 3***Traditional Classroom Versus Active Learning Classroom*

	Traditional Classrooms	Active Learning Classrooms	<i>t</i>	<i>Df</i>
<b>Classroom Activity</b>				
Lecture	0.774 (0.419)	0.545 (0.499)	4.786	386
Group Activity	0.366 (0.483)	0.455 (0.499)	1.769	386
Discussion	0.024 (0.155)	0.451 (0.501)	11.858	386
Q&A	0.409 (0.493)	0.451 (0.499)	0.830	386
<b>Content Delivery</b>				
PowerPoint	0.865 (0.343)	0.790 (0.408)	1.904	385
Board	0.368 (0.484)	0.469 (0.500)	1.982	385
<b>Instructor</b>				
At Podium	0.951 (0.216)	0.692 (0.463)	6.662	386
Not at Podium	0.311 (0.464)	0.893 (0.310)	14.790	386
Consulting	0.274 (0.448)	0.549 (0.861)	3.731	386
Not Consulting	0.774 (0.419)	0.861 (0.347)	2.220	385
<b>Students</b>				
High on Task	0.933 (0.251)	0.772 (0.420)	4.357	386
Mixed on Task	0.341 (0.476)	0.250 (0.430)	1.969	386
Low on Task	0.030 (0.172)	0.036 (0.186)	0.282	386

*Note.* Delivery of models of traditional classroom versus active learning classrooms. Adapted from “Space and Consequences: The Impact of Different Formal Learning Spaces on Instructor and Student Behavior,” by D. C. Brooks, 2012, *Journal of Learning Spaces*, 1(2), p. 5. Copyright 2012 by the University of North Carolina Greensboro.



Wagoner (2018) determined a correlation between the use of flexible seating and learning. The California Department of Education (2020) noted that students need environments that inspire discovery and profound learning, and flexible seating is fundamental to develop these environments. Movement in classrooms improves student learning (Hannaford, 2005). Hannaford (2005) specified, “Movements support the learner’s maximum potential by activating full brain function, decreasing environmental stressors and fully accommodating individual learning styles and pace” (p. 235).

### **Behavior and Students with Special Needs**

Hoofman (2018) argued it is a known fact that behavior and engagement is improved by the use of a flexible seating environment. Hannaford (2005) reported the following:

In children identified with ADD (Attention Deficit Disorder), Hyperactive or ADHD (Attention Deficit Hyperactivity Disorder), stress and lack of vestibular system development cause low or erratic RAS function. These children may flicker in and out of wakefulness, especially if there is no movement stimulation, which leads to hypo- or hyper-vigilance with difficulty in maintaining attention, concentration, or focus. (p. 170)

Hancock and Carter (2016) agreed, “The classroom environment plays a central role in encouraging positive behavior” (p. 2).

Classroom behavior research regarding the use of exercise balls in the classroom is usually centered around students with ADHD and autism (Massey et al., 2016). Massey et al. (2016) found, “Among children with ADHD, exercise balls have resulted in noticeably improved behavior, increased the ability to focus, and, as a result, higher

academic achievement” (p. 54). The ability to rock and move while seated on exercise balls increases a child’s ability to process information and improves sensory-brain stimulation (Ketcham & Burgoyne, 2015). Massey et al. (2016) discussed allowing the use of exercise balls decreases a student’s need to fidget and move, thus improving behavior.

Al-Eisa et al. (2013) asserted performance is improved when students sit in comfort on exercise balls. Learning is more efficient with greater on-task behavior, and sitting on exercise balls can increase the ability for students to finish reading, writing, and math assignments (Al-Eisa et al., 2013). Massey et al. (2016) found a significant decrease in behavior referrals when students sit on exercise balls. Students are more engaged when they can move, which increases the learning of new information (Paterson, 2019).

The school environment can positively impact a child’s ability to learn and time spent on task (Stapp, 2018). The National Center on Safe Supportive Learning Environments (2020) determined that students are more engaged when their environment is safe and stimulating. Raza (2017) discussed how a student’s environment influences his or her learning and behavior.

Approximately 11% of students in the United States are diagnosed with ADHD, which leads to delayed learning and an increased need for intervention (Chacko et al., 2019, p. 1). A classroom with flexible seating is useful for students who have difficulty paying attention or have ADHD (Raposa, 2017). Movement is used to self-regulate students with ADHD (Hartanto et al., 2016). Chacko et al. (2019) discussed:

Alternative seating is a sensory-based intervention that is often utilized by OTs [occupational therapists] with the intent to encourage students to be physically

active and meet their own sensory needs in an appropriate manner while in the classroom. This alternative seating may be in the form of a therapy ball, therapy cushion, or various other seating modifications. (p. 1)

There is a correlation between behavior and student engagement with the use of flexible seating for students who have ADHD (Hoofman, 2018).

Students with ASD have demonstrated improvements in behavior and increased engagement while in flexible seating classrooms (Massey et al., 2016). According to Schilling and Schwartz (2004):

Therapy balls, because they are a type of dynamic seating, may provide children with ASD an opportunity to both actively move and maintain an optimal arousal level while maintaining a healthy, safe, and productive posture. The use of therapy balls with students with Autism Spectrum Disorder is an effective intervention and improves on-task behaviors. (p. 424)

Students with ASD experience sensory integration and processing problems that impact their academic engagement and attention to tasks (Matin Sadr et al., 2017). Matin Sadr et al. (2017) indicated that using therapy balls can increase engagement. Schilling and Schwartz (2004) agreed, “Therapy balls are an effective intervention for improving both in-seat behavior and engagement for young children with ASD” (p. 424).

According to Matin Sadr et al. (2017), when seated on therapy balls, students with ASD display an 86.7% increase of in-seat behaviors when compared to standard chairs (para. 3). Flexible seating can be helpful for students who struggle with staying focused or who have attention disorders (Raposa, 2017). Students with ADHD who use balls and

air cushions in class appear calmer than when they are in traditional chairs (Matin Sadr et al., 2017).

Students with special needs benefit from an occupational therapist to help with recommendations for flexible seating (Thomas, 2017). Thomas (2017) noted occupational therapists recommend the use of sensory wobble cushions and wobble stools to meet student needs. Students with ASD require comfortable seating to be successful in educational environments, and choices improve overall academic success (Matin Sadr et al., 2017). Sorrell (2019) agreed students with ASD benefit from flexible seating due to an increase in overall learning, in-class behavior, and health.

### **Barriers to the Use of Flexible Seating**

Chacko et al. (2019) and Sorrell (2019) agreed that there is limited research available on flexible seating and whether flexible seating decreases negative behaviors and increases student performance. The limited research available is focused on the health benefits of using flexible seating (Sorrell, 2019). Wagoner (2018) recognized barriers to flexible seating and recommended a change in teachers' mindset related to their philosophy and structure of flexible seating in the classroom. Abdelbary (2017) also discussed that even though teachers understand the importance of allowing movement in the classroom, they feel a lack of support and help to manage this during the day, especially with the demand to increase the performance of students.

There are several disadvantages to the use of flexible seating, including the following: lack of parent understanding and support, the cost of implementing flexible seating, the overall distraction of different seating options, distractibility, especially for special needs students, and a lack of accessibility for some students (Thomson, 2018).

Chacko et al. (2019) determined there is limited research about the topic, and implementers should use caution. According to Chacko et al. (2019):

Studies report little to no change when using alternative seating. Due to the limited available evidence, occupational therapists and teachers should only consider using alternative seating if other evidence-based interventions have been tried and found to be ineffective. (p. 6)

The Canadian Centre for Occupational Health and Safety (2016) noted several disadvantages of flexible seating, mainly stability balls:

- The high amount of concentration required to maintain posture
- Muscle fatigue from sitting
- Lack of armrests as well as lack of adequate back support
- Reaching, swiveling, or moving are difficult
- High risk of falling when getting on and off the ball
- The ball can be unstable
- There is not adequate support for buttocks and thighs
- The workstation may need to be repositioned and readjusted often. (para. 11)

Castro (2019) evaluated a study from the Florida International University Center for Children and Families regarding the use of stability balls by students with ADHD. Castro (2019) examined 64 children ages five through 12 and found more benefit using behavior management approaches than using stability balls as flexible seating (para. 6).

## **Summary**

In Chapter Two, current literature was reviewed to examine different aspects of flexible seating. Topics included sensory needs, behavior concerns, environment, and

students with special needs. The use of flexible seating offers students alternatives to traditional desks and chairs while also establishing a classroom environment to help students concentrate and focus on tasks (Wright, 2020).

Sorrell (2019) claimed an overall health benefit from flexible seating, including improvement of both physical and mental health. The use of flexible seating is beneficial for students with health concerns, especially when they are expected to sit the majority of the day (D'Amico, 2016). Jensen (2000) summarized there are more benefits from an active learning environment than from being sedentary. Vaznis (2017) stated, "Exercise balls or wobble stools can have positive health benefits by allowing a child to burn calories, strengthen their core muscles and combat childhood obesity" (p. 2). The belief students should remain seated for an extended period of time with traditional seating needs to be changed, as research has indicated an increase in learning with movement (Merritt, 2014). Hannaford (2005) stated movement is essential in the learning process.

In the next chapter, the problem and purpose are explained, and the research questions are restated. The research design is detailed, and the population, sample, and instrumentation are presented. The data collection and data analysis processes are provided, and ethical considerations are discussed.

### **Chapter Three: Methodology**

The methodology used to implement the research study is described in this chapter. The problem and purpose and research questions are revisited. The research design, population and sample, instrumentation, data collection, and data analysis are explained. Lastly, ethical considerations are presented.

#### **Problem and Purpose Overview**

There is not a sufficient amount of research-based information available related to the use of flexible seating and the impact it has on learning (Ketcham & Burgoyne, 2015). Kilbourne et al. (2017) found there is an increase in positive research regarding learning and activity. Matin Sadr et al. (2017) established that alternative seating allows students with sensory deficiencies to demonstrate higher engagement and more on-task behaviors.

Dr. A. Jean Ayres, in 1972, developed the theory of sensory integration (Ayres & Robbins, 2005). Dr. Ayres's theory was based on data and an analysis of how children use sensory in learning (Ketcham & Burgoyne, 2015). Ayres and Robbins (2005) explained, "Learning and behavior are the visible aspects of sensory integration" (p. 27). According to Schilling and Schwartz (2004), "Sensory modulation strategies can provide the central nervous system with the type of sensory stimuli that bodies require to attain and maintain an optimal state of arousal for learning" (p. 424).

Research needs to be examined to determine the potential impact of flexible seating on academic achievement and behavior referrals (Massey et al., 2016). Romina (2014) stated, "Conducive classroom physical environment is an agent of intellectual stimulation and important factor in strengthening a child's educational development" (p.

1). Massey et al. (2016) determined students should be allowed to have movement and should not be in rigid traditional classroom seats so they can utilize their brains to increase learning. Students can be more focused and active when movement is allowed, helping them engage and comprehend their work (Massey et al., 2016). Movement as a result of different types of seating, such as hokki stools, yoga balls, and couches, can lead to increased and improved engagement and concentration (Walker, 2016).

The purpose of this study was to evaluate whether the use of flexible seating in the classroom environment increases student engagement, promotes learning, and decreases discipline referrals. It is believed that students in flexible seating classrooms display an overall increase in on-task behavior, improved learning, and a decrease in behavior referrals (Kariippanon et al., 2019). Information was gathered by surveying elementary teachers and principals as well as comparing DRA test scores of students in traditional classrooms with peers in flexible seating classrooms.

### ***Research Questions and Hypotheses***

The following research questions and hypotheses guided the study:

1. How is flexible seating utilized within first through fourth grades in southwest Missouri?
2. What perceived academic, behavioral, and sensory benefits do elementary teachers and principals report as a result of implementing flexible seating in the traditional seating classroom and special education classroom?
3. What difference, if any, exists between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating?



*H3<sub>o</sub>*: There is no difference between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

*H3<sub>a</sub>*: There is a statistically significant difference between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

4. What difference, if any, exists between the number of discipline referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating?

*H4<sub>o</sub>*: There is no difference between the number of discipline referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

*H4<sub>a</sub>*: There is a statistically significant difference between the number of discipline/behavior referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating.

### **Research Design**

A quantitative research design was selected as the method of research for this study. Creswell (2018) stated, “A survey design provides a quantitative design or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population” (p. 155). The purpose of a quantitative approach is to gather information about attitudes, characteristics, or behaviors related to the population (Creswell, 2018). One of the important facets of this research study was an examination of the types of flexible seating implemented in elementary schools located in southwest Missouri. The

perceived academic, behavioral, and sensory benefits of flexible seating, as reported by both elementary principals and teachers, were examined. Elementary principal and teacher responses were converted into a numerical form for quantitative analysis. The study included a comparison of DRA scores and behavioral incidents for third-grade students in classrooms with a flexible seating model and students in similar classrooms with traditional seating.

### **Population and Sample**

The research population consisted of 119 school districts from 25 counties in southwest Missouri. Each school district included elementary schools, and enrollment ranged from 95 students to 13,216 students. The number of certified staff ranged from 12 to 1,125. The teachers surveyed included first through fourth-grade classroom teachers from the 25 school districts in southwest Missouri. The districts were chosen because they comprised a sample of classrooms where flexible seating and traditional seating were used.

The sample for the survey portion of this research was selected using a census method. Consensus sampling is an approach where the entire population is selected (Creswell, 2018). All elementary teachers, including regular education, special education, special class teachers, and elementary principals in the southwest Missouri region, were invited to participate. According to the Center for Innovation in Research and Teaching (Grand Canyon University, n.d.), survey response rates for surveys vary, and with the general public, they are typically between 1% and 20%. The minimum sample size for this study was 100. It was anticipated that 20% of superintendents would pass along the information to their elementary principals and teachers. Accordingly, it was anticipated

that 20% of those teachers would respond to the survey. If 20% of the school districts participated in the study, it was expected at least 500 teachers would be sent the actual survey. A 20% participation rate would yield a minimum sample size of 100. Of the surveys sent, 107 agreed to participate.

For comparative purposes in this research study, 16 elementary school principals in southwest Missouri districts were contacted via email to determine what reading assessments were utilized in third grade and if they used flexible seating. Of the 16 elementary school principals contacted, three elementary principals agreed to participate in the study. These three districts included teachers who taught third grade, had experimented with flexible seating, and administered the DRA. The districts had a range of three to eight certified teachers in third grade.

### **Instrumentation**

The researcher created the survey for this study to identify how flexible seating was implemented in elementary schools in southwest Missouri. The survey was created by reviewing the literature surrounding flexible seating, traditional seating, and the works of Jensen (2005) and Ayres (Ayres & Robbins, 2005). The survey was also generated to explore whether elementary teachers perceived flexible seating as an effective tool for improving academics and behavior.

The survey consisted of 11 questions and statements (see Appendix B). The first three survey questions were designed for teachers to provide demographic information. This information included how long they had been teaching, their role in the district, and how long they had utilized flexible seating.

Survey questions four through six were designed to focus on why teachers began to experiment with flexible seating. The purpose of these survey questions was to determine what type of flexible seating teachers were utilizing in their classrooms, how they funded the flexible seating, and if there were any financial barriers attached to the use of flexible seating. Walker (2016) discovered flexible seating can be expensive, especially hokki stools and couches, but educators can find more cost-effective options.

The next three survey questions were developed to query teachers about what benefits they attributed to the use of flexible seating. Jensen (2000) found when students engage in a variety of movements, such as walking, leaning, or lying down, they experience less strain and harm on their bodies. D'Amico (2016) stated flexible seating helps with both education and overall student health.

Survey question number 10 was designed to determine the types of students benefiting from the use of flexible seating (e.g., students receiving special services, students with ADHD or behavior concerns, and students struggling academically). Matin Sadr et al. (2017) revealed that students with ASD, when using therapy balls, display improved behaviors. The final survey question was developed to determine whether there was an overall benefit from the implementation of flexible seating when compared to traditional seating classrooms. Asiyai (2014) asserted students are more engaged in their learning when the environment is improved. Merritt (2014) suggested behavior management and on-task behaviors may be improved with alternative seating.

Before use in the research study, survey questions were field-tested by a random sampling of 10 teachers to check for readability and redundancy. Creswell (2018) discussed the need for field testing to supply the researcher with validity and to improve

the content of the questions. This field test allowed for feedback on the survey before distribution.

### **Data Collection**

Once approval was received from Lindenwood University (see Appendix C), permission was sought from the school district superintendents by sending them a letter asking permission to survey their first through fourth-grade teachers. The invitation letter (see Appendix D) included directions for completing the survey, which was presented using the *Qualtrics* platform, and an informed consent form to participate in this study (see Appendix E). Superintendents were asked to forward the link to their building principals. Then, the principals sent the information to first through fourth-grade teachers.

Data collection for this research also included obtaining information from elementary principals in the three southwest Missouri schools. The principals were asked to provide data on DRA scores and behavioral incident referrals for third-grade classrooms during the 2017–2018 school year. Behavioral incident referrals included student disciplinary referrals made to the principal. The elementary principals categorized classroom data based upon traditional or flexible seating classrooms per grade level during the 2017–2018 school year.

### **Data Analysis**

The data to answer research questions one and two were determined using descriptive statistics, specifically the frequency of responses, to identify common trends concerning the use of flexible seating in southwest Missouri elementary school classrooms. Bluman (2017) summarized descriptive statistics as the collection and

presentation of data, whether through graphs, charts, or other forms. Creswell (2018) also stated descriptive statistics are often used to report frequencies.

Data for analysis of research questions three and four were compiled into a spreadsheet and were compared using a  $t$  distribution test to identify a statistical difference between classrooms utilizing flexible seating and traditional classrooms. Data allowed for comparison of the DRA scores and the number of behavior referrals in classrooms using two treatments, flexible seating and traditional seating classrooms.

### **Ethical Considerations**

Safeguards were established throughout the data collection and analysis phase. The safeguards included, but were not limited to the following:

#### ***To Assure Confidentiality***

Districts were informed that all documents, including reports, would be stored on an electronic device and destroyed three years from the completion of the project.

#### ***To Assure Anonymity***

The data requested from participating districts were non-identifiable. Data returned to the researcher only included the following: grade levels, flexible seating or traditional seating classroom, DRA scores (no student names included), and behavior incidences.

#### ***Overall***

Each participating elementary school in southwest Missouri received an email describing in detail the purpose of the research, any risks, and the opportunity to opt-out of the study.

**Summary**

In Chapter Three, the problem and purpose, as well as the research questions, were revisited. The research design study was explained in detail, including the population, sample, and instrumentation. Data collection was explained in a step-by-step manner, as was the process for analyzing the data. Lastly, the ethical considerations were explained.

In Chapter Four, the statistical analysis of the data is presented. First, the survey results are presented, followed by DRA scores used to establish if there was a significant difference between students in a flexible seating classroom and their peers in a traditional seating classroom. Next, the number of behavior referral incidents was examined to determine if there was a significant difference between students in flexible seating classroom environments compared to students of similar age in traditional seating classroom environments.

## **Chapter Four: Analysis of Data**

### **Introduction**

Flexible seating is a common term used in education, but there is a lack of available research to prove its effectiveness (Klein, 2020). The purpose of this study was to examine the use of flexible seating in elementary schools in southwest Missouri, as well as to gain an understanding of its use and effectiveness in the classroom setting. Specifically, the review of literature was focused on flexible seating as it relates to movement and the impact on academics and behavior.

The instrumentation tool used in this research elicited the perceptions of teachers and administrators with regard to flexible seating and its effectiveness. The three school districts that provided additional information revealed how flexible seating in the classroom impacted DRA scores and behavior referrals. The data could be used by educators and administrators interested in implementing flexible seating in classrooms. The survey instrument may be of use to school districts to measure different elements of flexible seating and perceptions of educators who have used or are using flexible seating.

The survey was created by the researcher and included 11 questions and statements for respondents, including items about types of flexible seating used and the impact of flexible seating on classroom behavior and academics. Demographic questions, including role in the district, years of experience, and how long flexible seating had been implemented in the respondent's classroom were included in the survey. Several survey statements were answered using a Likert-type scale.

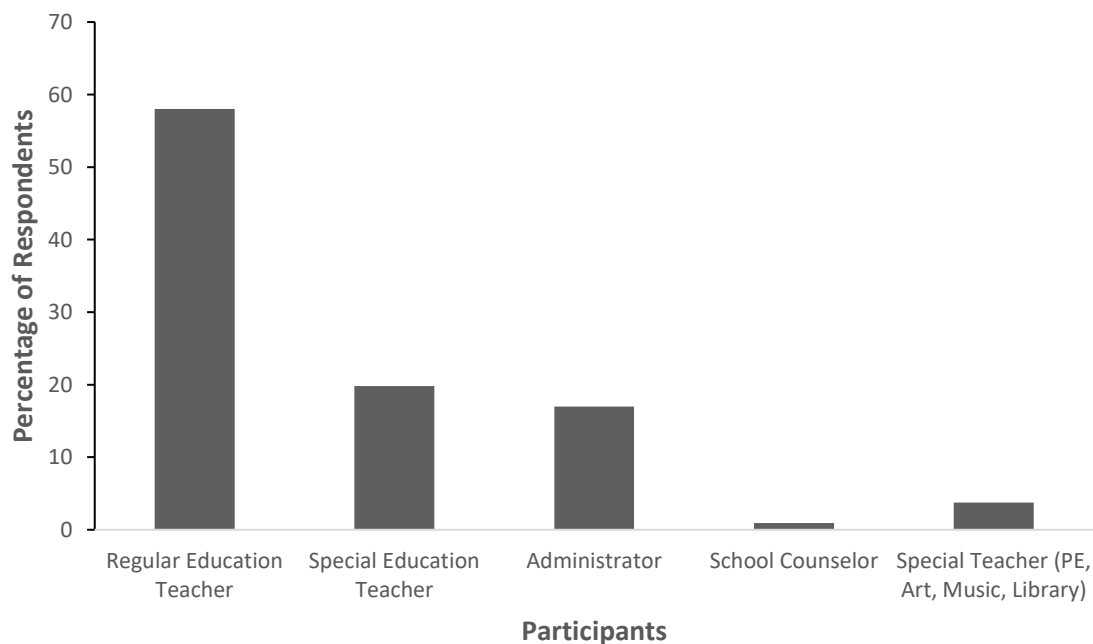


## Demographic Information of the Sample

Schools in southwest Missouri were invited to participate in the study. Superintendents were forwarded an email with a link to the *Qualtrics* survey, and they forwarded the survey to their elementary school staff. One superintendent emailed a response declining to participate in the study. After the surveys were sent by district administrators, 107 participants responded to the survey. Of the participants, 63 (58.88%) were regular education teachers, 21 (19.63%) were special education teachers, 18 (16.82%) were administrators, one (0.93%) was a school counselor, and four (3.74%) were identified as special teachers (PE, art, music, library) (see Figure 1).

**Figure 1**

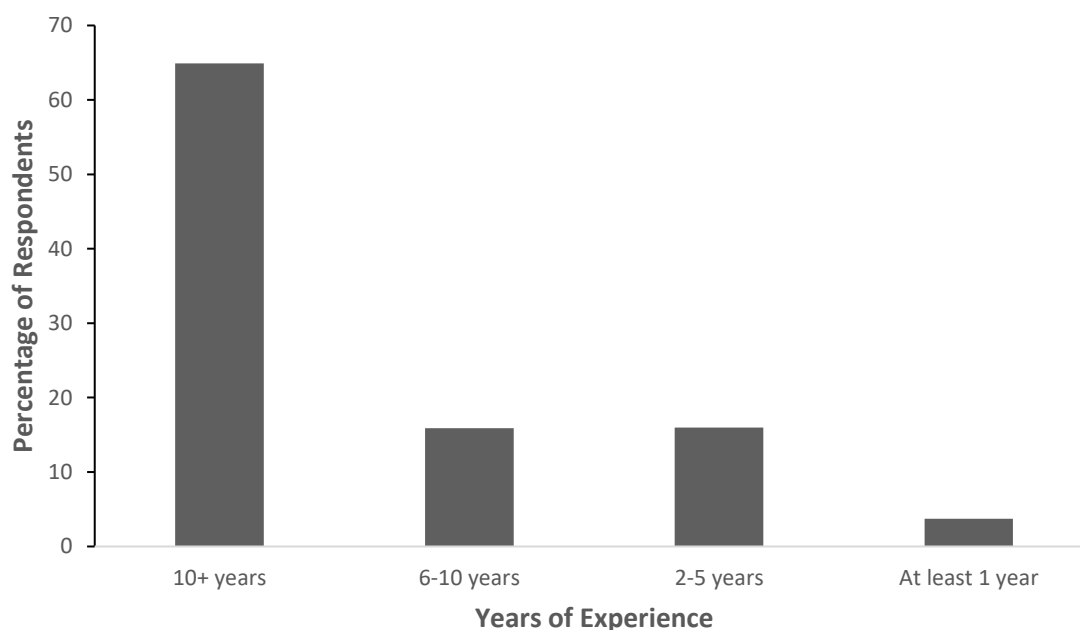
*Demographics of Participants*



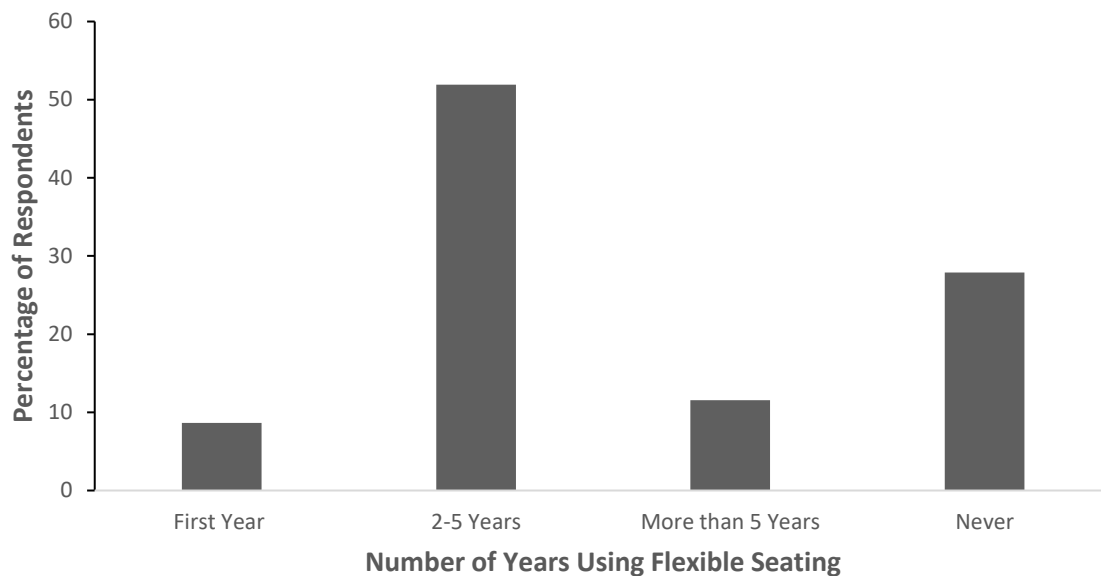
For survey question two, participants noted their years of experience. Of the responses received, four (3.74%) responded to having taught at least one year, 17 (15.99%) taught 2–5 years, 17 (15.89%) taught 6–10 years, and 69 (64.49%) taught 10 or more years (see Figure 2).

**Figure 2**

*Demographics of Years of Experience*



For survey question three, participants reported how long they had been using flexible seating in their classrooms. Of the 104 respondents, nine (8.65%) were in their first year, 54 (51.92%) had used flexible seating for 2–5 years, 12 (11.54%) had used flexible seating for more than five years, and 29 (27.88%) had never used flexible seating in their classrooms (see Figure 3).

**Figure 3***Demographics of Years Using Flexible Seating*

On survey question four, participants reported why they chose to use flexible seating. Of the 83 respondents, 10 (12.05%) chose flexible seating based on a research design, 35 (41.17%) saw another teacher using flexible seating, 11 (13.25%) viewed Pinterest or other websites, and 27 (32.53%) responded *Other* (see Figure 4). One participant commented:

Movement helps students stay focused, and as I read the research and was hesitant on trying some flexible seating, I found that the research made sense for some students. I tried a few things first, and now it is something I use daily. For many students, it is great for them to focus and participate in class.

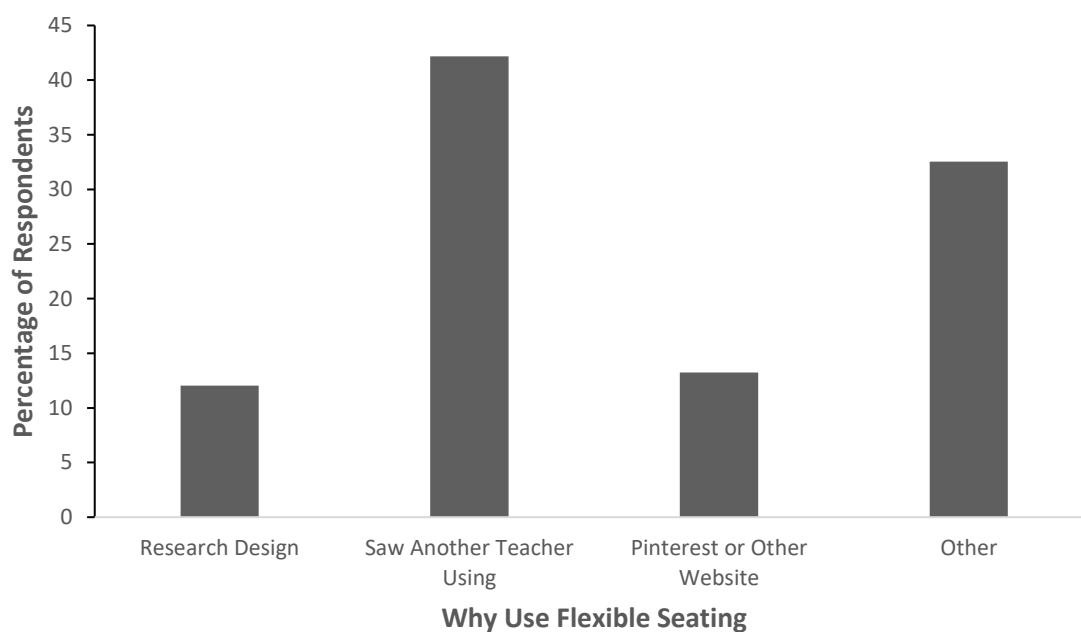
Another participant wrote:

I was interested in how flexible seating empowers students to make choices and be in control of their surroundings. I also liked the idea of students who have a difficult time being still having the freedom to move within limits.

Another participant noted, “Slight movement helps students to focus.”

**Figure 4**

*Reasons for Utilizing Flexible Seating*



In response to survey question five, participants chose the types of flexible seating they utilized in their classrooms. The common flexible seating choices provided include stand-up tables, yoga or therapy balls, bean bag chairs, wobble chairs, and *Other*.

Participants were instructed to choose all types of flexible seating that applied. Of the 206 responses, 48 used stand-up tables (23.30%), 52 used yoga balls or therapy balls

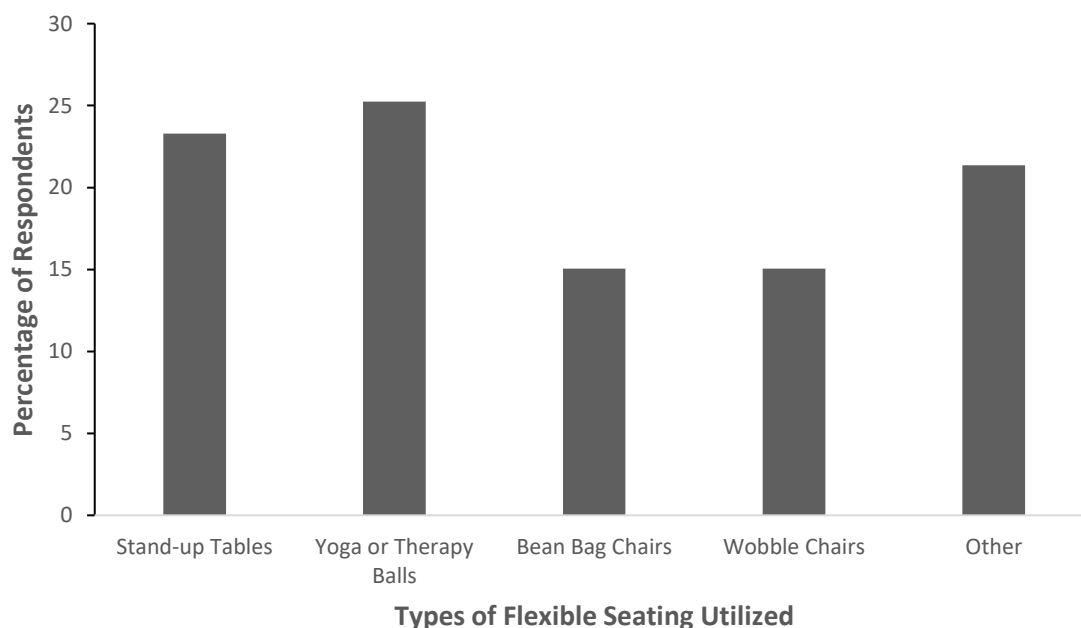
(25.24%), 31 used bean bag chairs (15.05%), 31 used wobble chairs (15.05%), and 44 used other options (21.36%) (see Figure 5).

One participant noted, “I have cube chairs in my classroom, which have three levels of seating depending on which way they are positioned. Depending on our activity for the day, I allow students to either stand or change position of the seat.” Of the participants who noted *Other*, four utilized rocking chairs, six used a type of crate seating, and four used stability discs. One participant noted:

Each student is different. Some stand, some use a pillow in the floor. I have bean bags for some and have lately adapted with exercise balls for some. If I see that one student needs something different, I try to make it happen the best that I can for each.

**Figure 5**

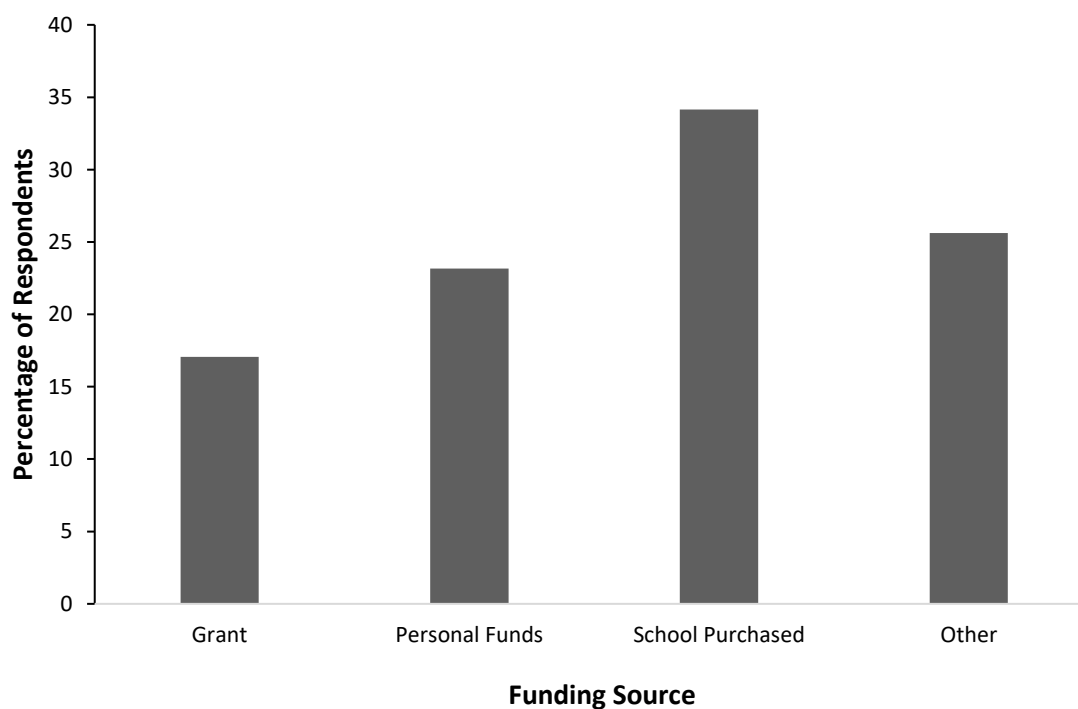
*Types of Flexible Seating*



In response to the next survey question, six participants answered how they funded flexible seating in their classrooms (see Figure 6). Participants were given four options. There were 82 responses including 14 who received a grant (17.07%), 19 who used personal funds (23.17%), 21 whose school purchased the items (34.15%), and 21 who answered other (24.61%). Two participants noted they used “Donors Choose” to fund flexible seating in their classrooms. One participant specifically noted, “Some I have purchased, and some the school has purchased, but none are that expensive. We try to adapt with what we have already.”

**Figure 6**

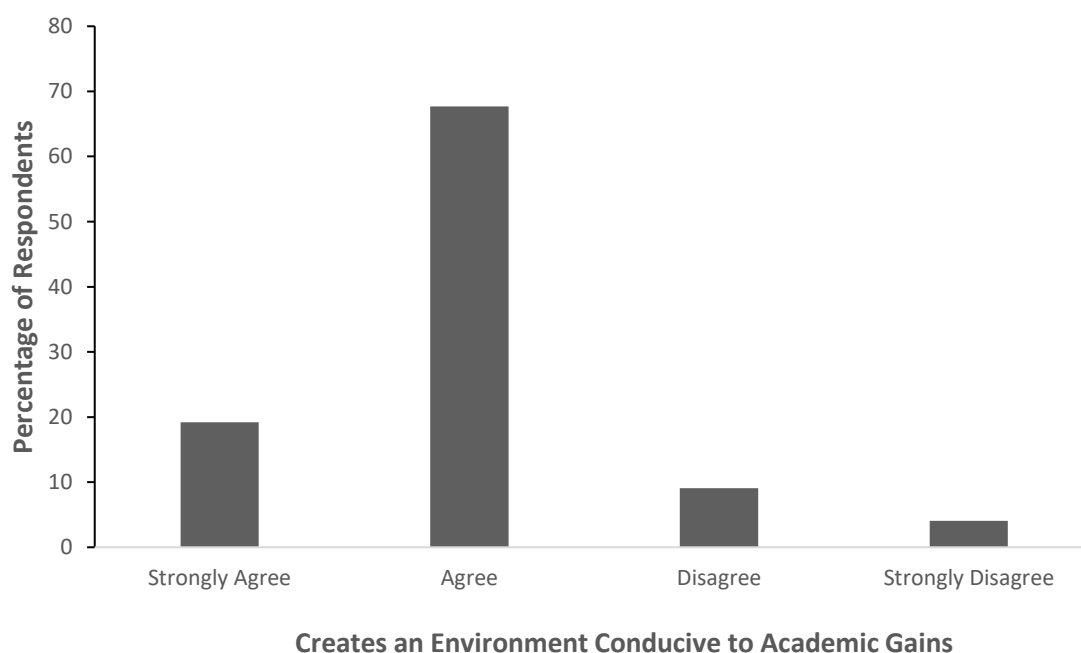
*Funding of Flexible Seating*



In response to survey statement seven, participants rated whether flexible seating helped create a classroom environment conducive to student academic gains. This survey statement was based on a Likert-type scale, and participants were given a choice from *strongly agree* to *strongly disagree*. A total of 99 participants responded, which yielded a mean of 4.76 and a standard deviation of 1.26. The following responses were given: *strongly agree* = 19 (19.19%), *agree* = 67 (67.68%), *disagree* = 9 (9.09%), and *strongly disagree* = 4 (4.04%) (see Figure 7).

**Figure 7**

*Flexible Seating and Academic Gains*

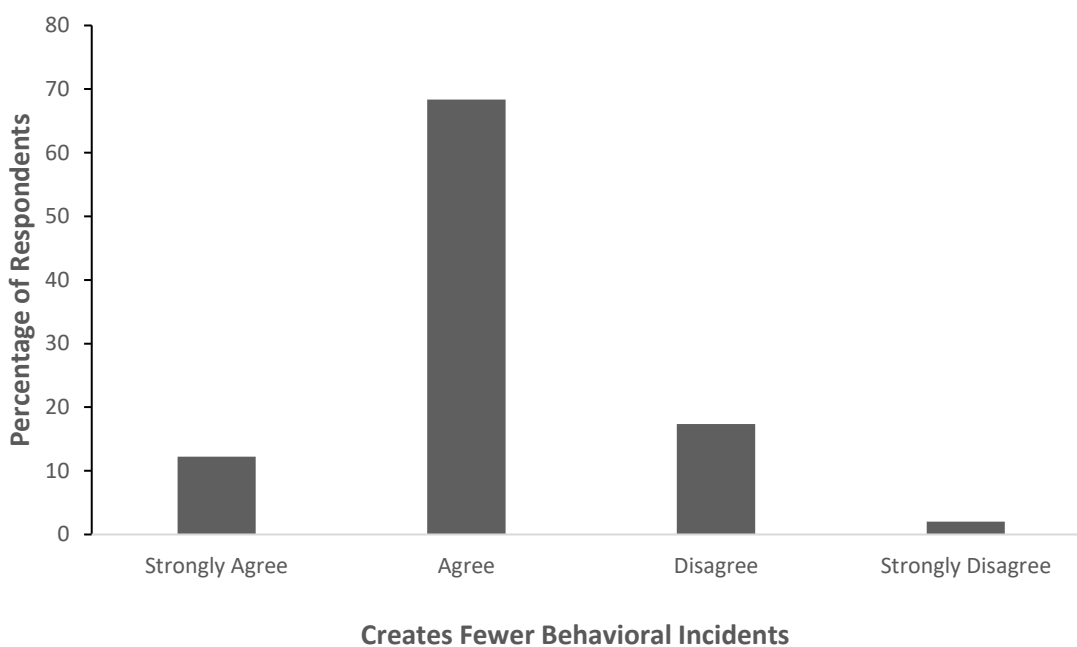


Next, for survey statement eight, participants responded if flexible seating helped create a classroom environment with fewer behavioral incidents. Participants rated the statement from *strongly agree* to *strongly disagree*. A total of 98 participants responded.

The mean was 5.33, and the standard deviation was 1.72. The results of the responses were as follows: *strongly agree* = 12 (12.24%), *agree* = 67 (68.37%), *disagree* = 17 (17.35%), and *strongly disagree* = 2 (2.04%) (see Figure 8).

**Figure 8**

*Flexible Seating and Behavior Incidents*

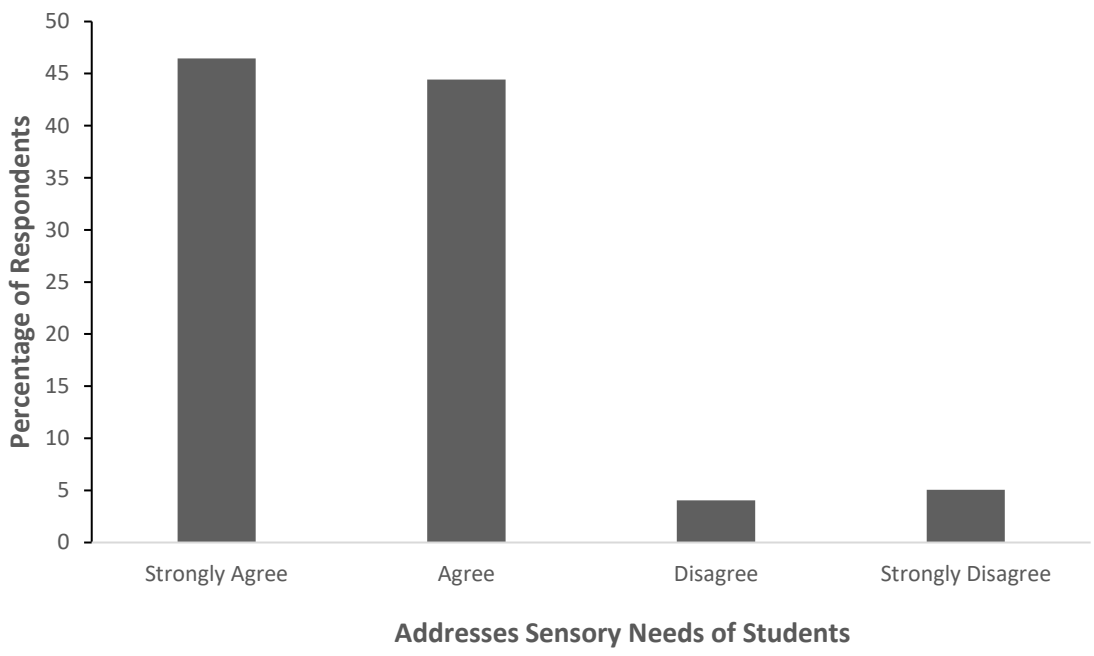


For survey statement nine, participants rated if flexible seating addressed the sensory needs of students. Participants chose *strongly agree*, *agree*, *disagree*, or *strongly disagree*. There were 99 participants who responded to this statement. The mean was 6.05, and the standard deviation was 1.54. The responses were as follows: *strongly agree* = 46 (46.46%), *agree* = 44 (44.44%), *disagree* = 4 (4.04%), and *strongly disagree* = 5 (5.05%) (see Figure 9).



**Figure 9**

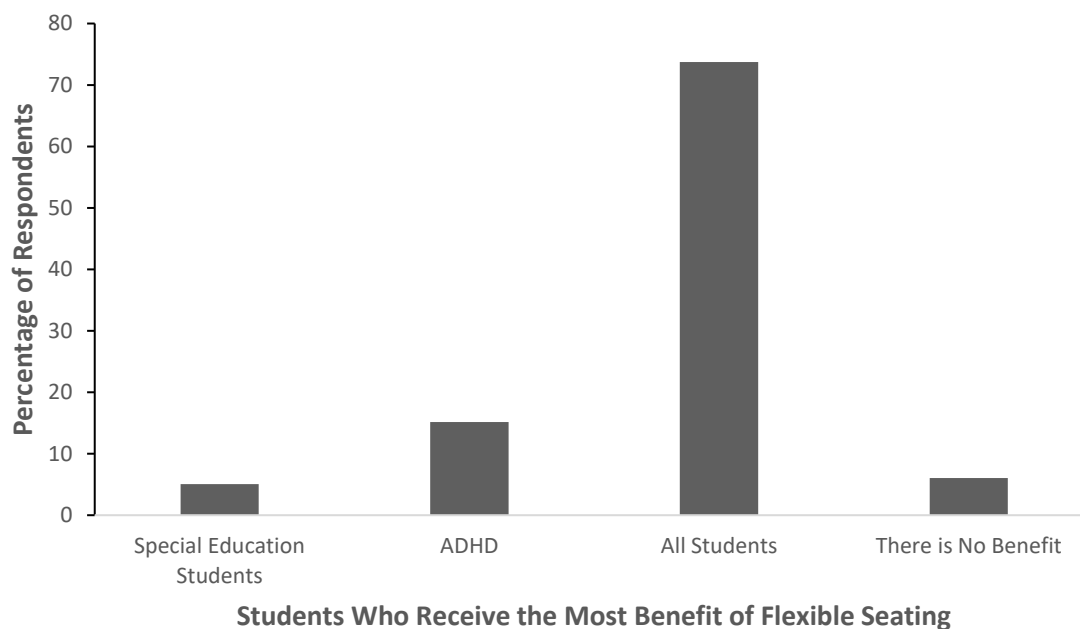
*Flexible Seating and Sensory Needs*



For question 10 on the survey respondents determined the population of students perceived as receiving the most benefit from flexible seating. A total of 99 participants responded. The results included the following: special education students = 5 (5.05%), students with known ADHD = 15 (15.15%), all students benefit from the use of flexible seating = 73 (73.74%), and there is not a benefit from the use of flexible seating = 6 (6.06%) (see Figure 10).

**Figure 10**

*Students Who Receive the Most Benefit from Flexible Seating*



For the last survey question, teachers responded if they felt flexible seating is a benefit to students compared to peers in traditional seating classrooms. A total of 99 participants responded with a choice of *yes* or *no* and were asked to explain their choices. The mean was 1.14, and the standard deviation was 0.34. The results were as follows: *yes* = 76 (86.36%) and *no* = 12 (13.64%) (see Figure 11). Participants were given the option to explain why they felt flexible seating was or was not a benefit. One participant noted:

It gives them the freedom to be comfortable in their learning environment. It is proven that all students learn in different ways, whether it be kinesthetically, verbally, visually, etc., so why wouldn't we offer them the same choices when it comes to their learning environment?

One participant specified, “Even as adults, we know what is comfortable and what is not. We know where we can learn best and where we do not. I believe the same is true for students.” A participant responded:

I believe there is value in flexible seating; however, it isn’t for every student and can be a problem for others. Flexible seating is often confused, and removing traditional seating isn’t allowing kids who need that type of seating to be flexible.

Another participant suggested, “Students can learn in a comfortable atmosphere. They can relax and focus on the lesson instead of staying still or constantly being reprimanded for disturbing others.”

According to another participant, “Flexible seating gives students ownership of how they learn best and can stay focused. They see it as a tool and not a play-thing.” One participant specified:

In my opinion, flexible seating is a benefit to all students. I have a period where I have a regular education classroom, and those students love the stability balls. I have several kids that have undiagnosed ADHD and don’t qualify for special education services, and the flexible seating really helps them focus.

Another participant noted, “Flexible seating is beneficial to students because it engages different muscle groups creating core strength. I believe this is beneficial to the learning process for students who are non-traditional learners.”

In the words of another participant, “Today’s culture is much more laid back and casual than in the past. Sitting straight and quiet in rigid rows stifles creativity. Creativity is a cornerstone of problem-solving.” Another respondent replied:

All students were allowed to use the flexible seating when they felt they needed the resource. Some days it was my special students that used the flexible seating more, and other days they might set at the side most of the day. Just used as a resource for them to use if any of my class needed that extra stimulation that this type of seating allowed.

A different respondent noted, “They are able to choose the best way for them to learn, focus, and concentrate.” Another participant wrote:

It allows my students to be in an environment that feels flexible. Students can allow themselves to get wiggles out or fidget in a way that allows them to focus and participate in class. I see a difference in student behavior and learning outcomes. It brings a positive learning environment to our class.

One participant responded, “Flexible seating works on core body strength, which in turn, builds fine and gross motor skills and utilizes both sides of the brain.”

Another participant wrote, “Movement is encouraged and motor skills. Movement results in brain stimulation.” The following response from a participant was noted:

My students are able to move around. I have sat in the chairs other teachers expect their students to use all day. They are uncomfortable! I don’t understand why learning should have to be uncomfortable; students are more willing to put forth effort if they are in a comfortable and safe environment.

Of the respondents who commented, 12 participants felt flexible seating did not prove to be a benefit compared to traditional seating. One participant noted:

I believe there is value in flexible seating; however, it isn't for every student and can be a problem for others. Flexible seating is often confusing, and removing traditional seating isn't allowing kids who need that type of seating to be flexible.

Another participant explained:

The kids enjoy it, but I often find most students either need to sit at a traditional desk for their own focus, safety, or academic needs, or they prefer to sit at their own desk for those same reasons. Further, flexible seating has caused behavioral issues in the past, particularly with talking and with getting out of your seat. I plan on having a regular desk for every child next year instead of any flexible seating for this reason.

Another participant also noted:

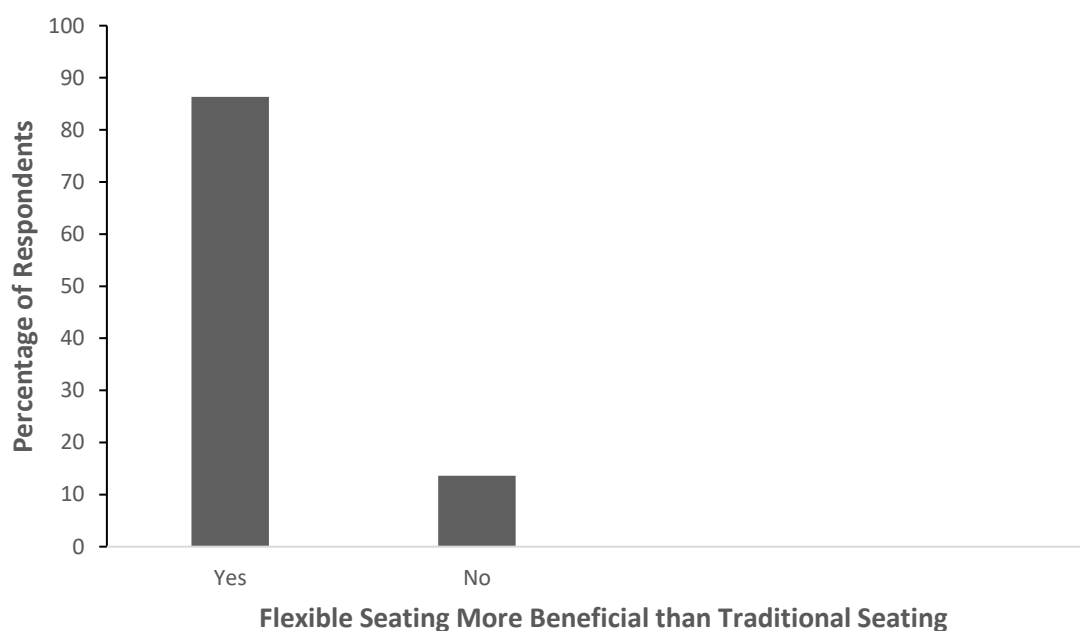
All our teachers bought into it the first year. Now there is one classroom that utilizes it. The class that still uses it is a mess. I have had a lot of trouble even getting my students because no one pays attention to what the teacher says. Special education students and students from low socio-economic areas, at least in my experience, benefit the least from it. Those kinds of kids benefit from clearly defined space that is theirs. Different types of chairs and standing desks can be beneficial if the student can use it responsibly, but the coffee shop vibe is ridiculous. Our students already struggle greatly with handwriting and poor fine motor control thanks to device usage (I am not talking sloppy handwriting. I'm talking can't even make letters). Sitting on a futon with a clipboard does not provide the same type of stability. Finally, it is difficult for substitute teachers to deal with as well and a safety concern.

A participant also noted:

It has been my experience that flexible seating increases undesirable behaviors and distraction/disruption in the classroom. Wobble stools and yoga balls being the main culprits. However, certain students seem to do well with bean bag seating as it is stationary. I have switched back to traditional seating with the option to stand while we are working at tables.

**Figure 11**

*Flexible Seating Benefits Compared to Traditional Seating*



To answer research questions three and four, 16 elementary school district principals in southwest Missouri were contacted to see if they utilized both the DRA assessment and had third-grade classrooms with flexible seating and others with traditional seating. Of the 16 districts, three school districts responded they used the DRA

assessment, as well as flexible seating, and agreed to provide data. Once the elementary principals agreed to provide data, the principals were asked to make the following available: DRA scores, the number of behavioral incidents, and if each classroom utilized flexible seating or traditional seating. Principals were instructed to provide the information in non-identifiable form.

When examining the data, there were two treatment conditions: flexible seating and traditional seating classrooms. The *t*-distribution test was performed on the DRA scores and the number of behavior referrals. An independent two-tailed *t*-test was conducted to determine if there was a statistical difference. The *t*-distribution test was used to examine the district DRA scores to determine if the resulting *p*-value was less than .05. A significant difference in the means between the two groups would indicate the null hypothesis would be rejected. The *t*-distribution test was also performed for the number of behavior referral occurrences to determine if the resulting *p*-value was less than .05. A significant difference in the means of the two groups would indicate the null hypothesis would be rejected.

Research question three asked what difference if any, exists between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating. According to Scholastic, students in the third grade should be at a DRA level between 30 and 38, which is equivalent to a Lexile reading level of 520 to 820 and grade level equivalents of 3.0 to 3.9.

District A provided the following data related to their DRA scores from three third-grade classrooms. Classroom 1 was a flexible seating classroom with 17 students. Four students moved out of the district during the school year. There were not complete

data for those four students. The remaining 13 students showed growth in their DRA scores for the school year. Data of the students in Classroom 1 revealed the following: 76% began the school year below grade level, and 23.5% began the school year on grade level. The end-of-year DRA yielded the following results: five students (38.4%) were not on grade level, and eight (61.5%) of the students were on grade level (see Table 4)

**Table 4**

*District A Classroom 1 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	24	34	38
B	20	left district	left district
C	28	34	38
D	20	28	30
E	30	38	38
F	20	left district	left district
G	20	24	28
H	28	30	38
I	20	28	28
J	30	38	38
K	40	42	44
L	20	28	left district
M	28	30	left district
N	30	30	34
O	24	24	28
P	24	30	38
Q	28	34	38



Classroom 2 was a traditional seating classroom with 17 students. Of the students beginning the year, 16 (94.1%) were below the expected grade level, and one (0.58%) was on grade level. The end-of-year DRA results were as follows: on grade level were five (29.4%) students, and below the expected grade level were 12 (70.5%) students. It was noted that all students showed growth in their DRA scores during the school year (see Table 5).

**Table 5**

*District A Classroom 2 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	28	34	34
B	24	30	40
C	28	34	34
D	24	30	34
E	16	20	28
F	38	38	40
G	20	24	28
H	4	6	8
I	24	30	34
J	24	30	34
K	28	34	38
L	16	20	24
M	28	34	38
N	28	34	38
O	24	28	30
P	20	24	28
Q	28	38	40

District A reported from Classroom 3, a flexible seating classroom, the following information. The DRA scores of 17 students and four students who moved during the school year with incomplete data were as follows: 17 (100%) students were below the expected DRA level of 30, and none (0%) were on grade level for the fall assessment. The end-of-year DRA scores yielded the following information: 10 (76.9%) continued to be below grade level, and three (23%) were on grade level. All 13 students (100%) did show growth in their DRA scores (see Table 6).

**Table 6**

*District A Classroom 3 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	20	28	30
B	10	left district	left district
C	16	20	28
D	4	8	10
E	24	24	28
F	20	24	34
G	24	34	38
H	18	24	28
I	18	left district	left district
J	24	28	28
K	24	left district	left district
L	20	24	left district
M	24	28	30
N	4	8	10
O	24	34	38
P	26	28	34

The two-tailed  $t$ -distribution test of District A yielded the following results, with the first treatment being flexible seating classrooms and the second being traditional seating classrooms. The two-sample  $t$ -test was conducted to assess if the  $p$ -value was less than the  $\alpha$  value of .05. With a value of  $p \leq .866988$ , the null hypothesis was rejected, and it was concluded there was not a significant statistical difference between the two groups. There was not a significant difference in the students' DRA scores in a flexible seating environment when compared to DRA scores in a traditional seating environment for District A. The  $t$ -value was -0.16851. The  $p$ -value was .866988. The result was not significant at  $p < .05$  (see Table 7).

**Table 7**

*District A Summary of Descriptive Statistics of DRA scores in Flexible Seating Classrooms and Traditional Seating Classrooms*

Group	Total Points Possible	$M$
Flexible Seating Classrooms <sub>1</sub>	60	31.33
Traditional Seating Classrooms <sub>2</sub>	65	31.76
Hypothesized Mean Difference		0

*Note.*  $N_1 = 27$ .  $N_2 = 17$ .

### **District B**

District B provided the following data related to their DRA scores from three third-grade classrooms. Classroom 1 was a traditional seating classroom with 20 students. Classroom 2 was a flexible seating classroom with 21 students, and Classroom 3 was a flexible seating classroom with 21 students. All three classrooms had students move in or

out of the district during the school year. Complete data could not be provided for the transient students.

Of the students in Classroom 1, 40% began the school year below grade level, and 55% began the school year on grade level. End-of-year DRA assessment yielded the following results: five (25%) students were not on grade level, and 15 (75%) of the students were on grade level (see Table 8).

**Table 8**

*District B Classroom 1 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	12	--	28
B	28	30	38
C	34	38	50
D	30	40	50
E	30	38	50
F	38	40	60
G	30	40	50
H	18	20	34
I	34	40	60
J	30	40	60
K	18	30	38
L	28	30	40
M	34	40	60
N	24	28	28
O	30	38	40
P	30	40	40
Q	34	34	40
R	6	--	14
S	14	24	28
T	38	40	40

District B reported from Classroom 2, which was a flexible seating classroom, the following information. The DRA scores of 21 students and one student who moved during the school year with incomplete data were as follows: five (23.8%) students were below the expected DRA level of 30, and 15 (71.4%) were on grade level on the fall assessment. The end-of-year DRA scores yielded the following: six (28.5%) students continued to be below grade level, 14 (66.66%) were on grade level, and one student had moved. Twenty students showed growth in their DRA scores (see Table 9).

**Table 9***District B Classroom 2 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	24	28	30
B	30	34	38
C	34	38	40
D	6	8	--
E	38	40	50
F	40	40	50
G	30	30	38
H	30	30	38
I	38	38	40
J	40	40	50
K	40	40	50
L	34	34	38
M	30	34	38
N	20	20	24
O	30	30	34
P	38	40	40
Q	30	38	40
R	28	28	30
S	28	28	30
T	50	50	50
U	30	30	34

District B reported from Classroom 3, which was a flexible seating classroom, the following information. Examined were the DRA scores of 21 students, one student who moved in during the school year with incomplete data, and two students without a spring assessment. For the fall assessment, six (28.57%) students were below the expected DRA level of 30. Another 14 (66.66%) students, as well as one student who was not enrolled in the district, were on grade level on the fall assessment. The end-of-year DRA scores

yielded the following information: four (19%) students continued to be below expected grade level, 15 (71.4%) were on grade level, and two students did not have end-of-year scores. All students showed growth in their DRA scores (see Table 10).

**Table 10**

*District B Classroom 3 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	34	38	40
B	30	34	38
C	34	38	40
D	30	34	40
E	18	28	30
F	40	40	50
G	34	38	40
H	30	34	38
I	--	34	38
J	30	34	38
K	34	38	--
L	38	40	50
M	30	34	38
N	30	34	40
O	30	34	40
P	24	28	30
Q	30	34	40
R	20	28	--
S	18	24	28
T	20	28	30
U	28	30	38

The two-tailed *t*-distribution test of District B yielded the following results with the first treatment being flexible seating classrooms and the second being traditional

seating classrooms. The two-sample  $t$ -test was independent and was conducted to assess if the  $p$ -value was less than the  $\alpha$  value of .05. With a value of  $p \leq .149441$ , the null hypothesis was rejected, and it was concluded there was not a significant statistical difference between the two groups. There was not a significant difference in the students' DRA scores in a flexible seating environment when compared to DRA scores in a traditional seating environment for District A. The  $t$ -value was -1.46124. The  $p$ -value was .149441. The result was not significant at  $p < .05$  (see Table 11).

**Table 11**

*District B Summary of Descriptive Statistics of DRA scores in Flexible Seating Classrooms and Traditional Seating Classrooms*

Group	Total Points Possible	$M$
Flexible Seating Classrooms <sub>1</sub>	39	38.72
Traditional Seating Classrooms <sub>2</sub>	20	42.4
Hypothesized Mean Difference		0

*Note.*  $N_1 = 39$   $N_2 = 20$ .

### **District C**

District C provided the following information to show data related to their DRA scores from eight third-grade classrooms. Of the classrooms, five were utilizing flexible seating, and three used traditional seating. DRA scores were reported for the fall, winter, and spring assessments.

Classroom 1 was a traditional seating classroom with 22 students with one student who moved into the district with incomplete data provided. The fall assessment revealed nine students (40.9%) below grade level and 12 students (54.5%) on grade level. The



spring DRA assessment yielded the following results: below grade level were nine (40.9%) students, and 13 (59%) were on grade level. All students experienced growth in their DRA scores over the course of the school year (see Table 12).

**Table 12**

*District C Classroom 1 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	8	--	12
B	30	38	40
C	20	24	28
D	30	38	40
E	40	40	50
F	34	34	40
G	18	18	20
H	18	24	28
I	34	34	38
J	20	20	24
K	38	38	40
L	34	34	40
M	24	28	34
N	34	34	40
O	38	38	50
P	38	38	40
Q	34	34	38
R	1	3	4
S	--	38	50
T	20	24	28
U	30	38	40
V	14	14	18

Classroom 2 was a flexible seating classroom with 22 students. Classroom 2 had a student move into the district, and one student received homebound services during the school year, which resulted in incomplete data. The fall DRA assessment data revealed 14 (63.6%) students were below the expected beginning-of-the-year level, and seven (31.8%) students were on grade level. The spring and final assessment revealed the following information: 10 (45.45%) students were below grade level, and 11 (50%) students were on grade level. There was one student with incomplete data, and .4% of the students did not show growth over the course of the school year (see Table 13).

**Table 13***District C Classroom 2 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	38	38	40
B	34	34	38
C	30	30	38
D	28	30	38
E	--	--	34
F	34	34	38
G	18	24	28
H	14	16	20
I	28	30	34
J	16	20	28
K	24	28	--
L	20	24	28
M	34	34	34
N	28	30	38
O	24	30	38
P	20	28	34
Q	28	30	38
R	28	34	38
S	38	38	40
T	38	38	40
U	16	18	20
V	18	20	30

Classroom 3 was a flexible seating classroom with 24 students. Data for Classroom 3 yielded the following results: 14 (58.36%) students began the school year below grade level, and nine (37.5%) began the school year on grade level. One student did not have complete data. The end-of-year DRA yielded the following results: five (20.8%) students were not on grade level, and 19 (79.1%) of the students were on grade level (see Table 14).

**Table 14***District C Classroom 3 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	40	40	50
B	14	18	20
C	--	--	40
D	28	34	38
E	28	30	38
F	28	34	38
G	28	30	38
H	30	34	38
I	20	28	34
J	34	34	38
K	34	34	38
L	20	28	30
M	28	34	38
N	28	34	38
O	30	34	38
P	38	38	40
Q	38	38	40
R	28	34	38
S	3	4	3
T	28	34	38
U	28	30	34
V	28	34	38
W	40	40	50
X	34	34	38

Classroom 4 was a flexible seating classroom with 23 students. Data for Classroom 4 yielded the following results: nine (39.1%) students began the school year below grade level, and 13 (56.5%) students began the school year on grade level. One

student did not have complete data. The end-of-year DRA results yielded the following results: nine (39.1%) students were not on grade level, 14 (60.8%) of the students were on grade level, and nine (0.39%) did not show growth (see Table 15).

**Table 15**

*District C Classroom 4 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	30	34	40
B	--	--	30
C	40	40	50
D	24	28	30
E	30	38	38
F	28	30	34
G	30	34	38
H	30	40	50
I	30	34	40
J	28	34	40
K	30	34	38
L	40	40	50
M	30	34	40
N	20	24	30
O	20	24	28
P	34	34	38
Q	28	30	34
R	18	20	24
S	34	34	40
T	24	28	28
U	14	18	18
V	30	34	38
W	40	40	50

District C Classroom 5 was a flexible seating classroom with 22 students.

Classroom 5 data yielded the following results: 14 (63.6%) began the school year below expected grade level for the beginning of the year, seven (31.8%) began the school year on expected grade level, and one student had incomplete data. The end-of-year DRA yielded the following results: 10 (45.4%) were not on grade level, 12 (54.5%) of the students were on grade level, and all students showed growth (see Table 16).

**Table 16***District C Classroom 5 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	40	40	50
B	20	24	30
C	2	3	4
D	12	14	20
E	38	38	50
F	34	34	40
G	30	30	38
H	24	28	30
I	10	14	34
J	28	30	40
K	40	40	50
L	28	34	38
M	--	30	40
N	40	40	50
O	24	24	28
P	24	28	34
Q	3	4	14
R	3	3	4
S	28	30	40
T	28	34	38
U	34	38	50
V	18	18	20

District C Classroom 6 was a traditional seating classroom with 22 students.

Classroom 6 data yielded the following results: 12 (54.5%) began the school year below expected grade level for the beginning of the year, and 10 (45.4%) began the school year on expected grade level with all students having complete data. At the end of the year, the DRA yielded the following results: eight (36.3%) students were not on grade level, 14

(63.6%) of the students were on grade level, and all students showed growth (see Table 17).

**Table 17**

*District C Classroom 6 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	40	40	50
B	12	18	24
C	20	24	30
D	34	34	40
E	20	28	34
F	40	40	50
G	28	30	34
H	28	38	40
I	40	40	50
J	3	4	6
K	34	34	38
L	28	30	38
M	38	38	50
N	38	38	50
O	3	6	8
P	3	6	8
Q	28	34	40
R	28	38	50
S	40	40	50
T	38	38	50
U	38	38	50
V	10	12	14

Classroom 7 was a classroom utilizing flexible seating with 22 students.

Classroom 7 data yielded the following results: 11 (50%) began the school year below



expected grade level, and 10 (45.4%) began the school year on expected grade level. One student did not have complete data. The end-of-year DRA yielded the following results: 10 (45.4%) students were not on grade level, and 12 (54.5%) of the students were on grade level. Only one student did not show growth for the year when comparing fall DRA scores with spring scores (see Table 18).

**Table 18**

*District C Classroom 7 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	38	38	40
B	40	40	50
C	12	14	16
D	24	28	38
E	40	40	40
F	38	38	40
G	38	38	40
H	18	20	28
I	20	24	24
J	40	40	50
K	28	30	38
L	34	34	38
M	14	16	20
N	38	38	40
O	20	24	30
P	18	20	24
Q	16	18	18
R	20	24	30
S	--	--	6
T	40	40	50
U	30	30	38
V	20	24	24

District C Classroom 8 was a traditional seating classroom with 23 students. Classroom 8 data yielded the following results: 10 (43.4%) students began the school year below expected grade level, and 13 (56.5%) began the school year on expected grade level. All students had complete data. End-of-year DRA scores yielded the following results: eight (34.7%) students were not on grade level, and 15 (65.2%) of the students were on grade level. Only one student did not show growth for the year when comparing fall DRA scores with spring scores (see Table 19).

**Table 19***District C Classroom 8 DRA Scores*

Student	DRA Fall	DRA Winter	DRA Spring
A	38	38	40
B	20	24	28
C	40	40	50
D	16	18	24
E	40	40	50
F	0	1	1
G	24	28	38
H	24	30	38
I	34	34	38
J	30	38	38
K	14	16	18
L	16	20	24
M	34	34	38
N	8	10	14
O	30	34	40
P	10	12	16
Q	40	40	50
R	38	38	40
S	40	40	50
T	18	20	24
U	38	38	38
V	34	34	38
W	30	34	38

District C was comprised of eight classrooms, five utilizing flexible seating and three using traditional seating. The DRA data for the district were compared using a two-tailed *t*-distribution test of District C, which yielded the following results, with the first treatment being flexible seating classrooms and the second being traditional seating

classrooms. The two-sample  $t$ -test was conducted to assess if the  $p$ -value was less than the  $\alpha$  value of .05. With a value of  $p \leq .905001$ , the null hypothesis was rejected, and it was concluded there was not a significant statistical difference between the two groups. There was not a significant difference in the students' DRA scores in a flexible seating environment when compared to DRA scores in a traditional seating environment for District C. The  $t$ -value was 0.11952. The  $p$ -value was .905001. The result was not significant at  $p < .05$  (see Table 20).

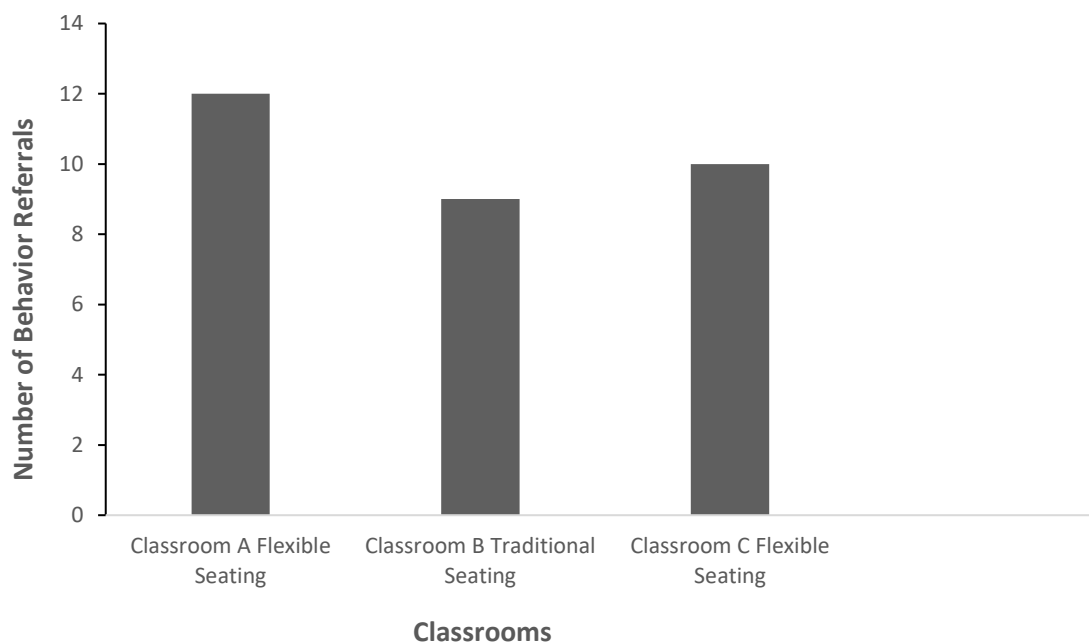
**Table 20**

*District C Summary of Descriptive Statistics of DRA Scores in Flexible Seating Classrooms and Traditional Seating Classrooms*

Group	Total Points Possible	$M$
Flexible Seating Classrooms <sub>1</sub>	112	34.79
Traditional Seating Classrooms <sub>2</sub>	67	34.58
Hypothesized Mean Difference		0

*Note.*  $N_1 = 112$   $N_2 = 67$ .

Research question four addressed what difference, if any, exists between the number of discipline referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating. District A provided behavior referral numbers for their three classrooms, and each was designated as using flexible seating or traditional seating. The following information was provided for the three classrooms (see Figure 12).

**Figure 12***Behavior Referrals for District A*

To determine if there was a significant difference in behavior referrals between flexible seating and traditional seating classrooms in District A, a *t*-distribution test was performed. The test was a two-tailed distribution test. The first treatment was a flexible seating classroom, and the second treatment was a traditional seating classroom. A two-sample independent *t*-test was conducted to assess if the *p*-value was less than the  $\alpha$  value of .05. With a value of  $p \leq .76214$ , the null hypothesis was rejected, and it was concluded there was not a significant statistical difference in the scale scores between the two groups. There was not a significant difference in students' behavior referrals in a flexible seating classroom and students' behavior referrals in a traditional seating classroom for District A. The *t*-value was 0.25966. The *p*-value was .76214. The result was not significant at  $p < .05$  (see Table 21).

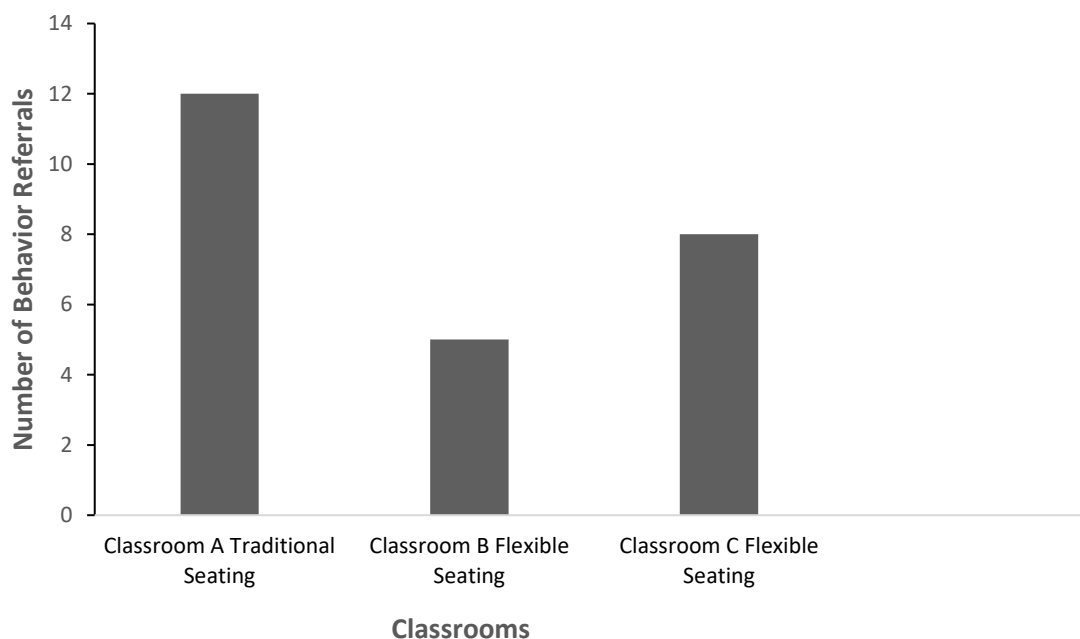
**Table 21**

*District A Summary of Descriptive Statistics of Behavior Referrals in Flexible Seating Classrooms and Traditional Seating Classrooms*

Group	Total Points Possible	<i>M</i>
Flexible Seating Classrooms <sub>1</sub>	34	0.65
Traditional Seating Classrooms <sub>2</sub>	17	0.53
Hypothesized Mean Difference		0

*Note.*  $N_1 = 34$ .  $N_2 = 17$ .

District B reported the following data for behavior referrals for three classrooms. Two classrooms reported using flexible seating, and one reported a traditional seating environment. Classroom A utilized a traditional seating model and reported 12 behavior incident referrals. Classroom B, a flexible seating classroom, reported five behavior referrals, and Classroom C utilized flexible seating and reported eight behavior referrals. (see Figure 13).

**Figure 13***Behavior Referrals for District B*

A two-tailed *t*-distribution test was performed for District B to see if a statistical difference existed between the flexible seating and traditional seating classrooms. A two-sample independent *t*-test was conducted to assess if the *p*-value was less than the  $\alpha$  value of .05. With a value of  $p \leq .594553$ , the null hypothesis was rejected, and it was concluded there was not a significant statistical difference in the scale scores between the two groups. There was not a significant difference in students' behavior referrals in a flexible seating classroom and students' behavior referrals in a traditional seating classroom for District B. The *t*-value was -0.53516. The *p*-value was .594553. The result was not significant at  $p < .05$  (see Table 22).

**Table 22**

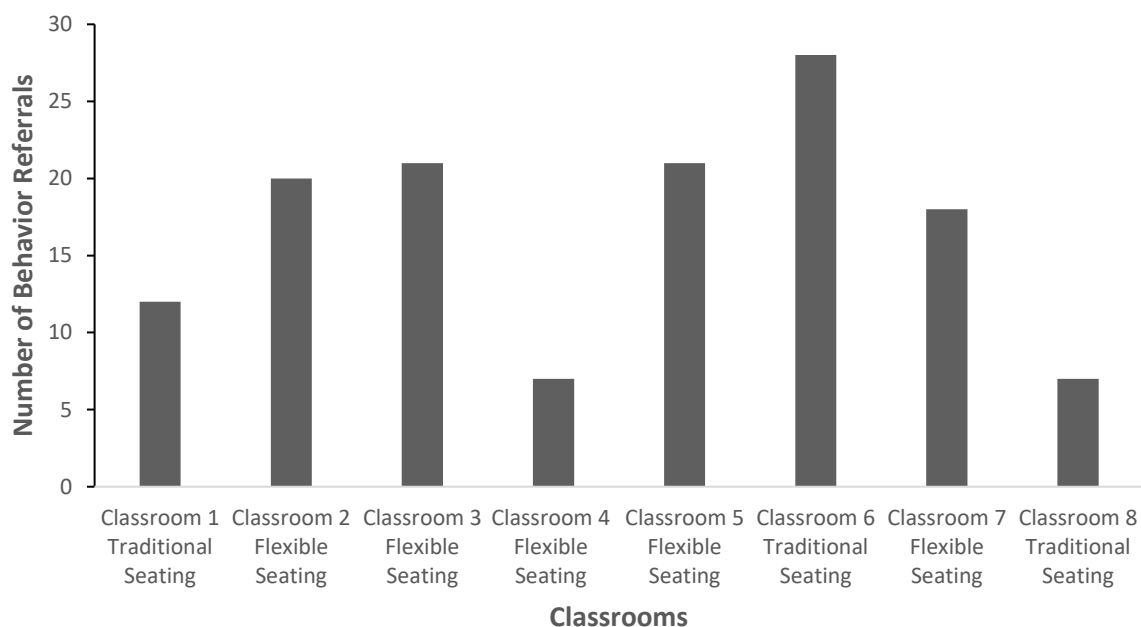
*District B Summary of Descriptive Statistics of Behavior Referrals in Flexible Seating Classrooms and Traditional Seating Classrooms*

Group	Total Points Possible	<i>M</i>
Flexible Seating Classrooms <sub>1</sub>	41	0.32
Traditional Seating Classrooms <sub>2</sub>	20	0.6
Hypothesized Mean Difference		0

*Note.*  $N_1 = 41$ .  $N_2 = 20$ .

District C provided data on eight classrooms, with five classrooms utilizing flexible seating and three utilizing traditional seating. District C reported behavior incident referrals as follows: Classroom 1, a traditional seating classroom, with 12 referrals; Classroom 2, a flexible seating classroom, with 20 referrals; Classroom 3, a flexible seating classroom, with 21 behavior referrals; Classroom 4, a flexible seating classroom, with seven referrals; Classroom 5, a flexible seating classroom, with 21 behavior referrals; Classroom 6, a traditional seating classroom, with 28 referrals for behavior; Classroom 7, a flexible seating classroom, with 18 referrals; and Classroom 8, a traditional seating classroom, with seven behavior referrals (see Figure 14).



**Figure 14***Behavior Referrals for District C*

A two-tailed *t*-distribution test was performed for District C to determine if a statistical difference existed between the flexible seating and traditional seating classrooms. A two-sample independent *t*-test was conducted to assess if the *p*-value was less than the  $\alpha$  value of .05. With a value of  $p \leq .776109$ , the null hypothesis was rejected, and it was concluded there was not a significant statistical difference in the scale scores between the two groups. There was not a significant difference in the students' behavior referrals in a flexible seating classroom and students' behavior referrals in a traditional seating classroom for District C. The *t*-value was 0.29751. The *p*-value was .776109. The result was not significant at  $p < .05$  (see Table 23).

**Table 23**

*District C Summary of Descriptive Statistics of Behavior Referrals in Flexible Seating Classrooms and Traditional Seating Classrooms*

Group	Total Points Possible	<i>M</i>
Flexible Seating Classrooms <sub>1</sub>	5	17.4
Traditional Seating Classrooms <sub>2</sub>	3	15.67
Hypothesized Mean Difference		0

*Note.*  $N_1 = 5$ .  $N_2 = 3$ .

### Summary

Approximately 119 school districts in southwest Missouri were invited to participate in the study, and 107 participants completed the survey. Participants provided information related to demographics. Included in the demographic portion of the survey were the participant's role in the district, years of experience, and how long flexible seating had been utilized. Participants identified why they chose to implement flexible seating, the types of flexible seating utilized, and how the flexible seating was funded. Then, participants were presented with a Likert-type scale to rate the following statements: flexible seating creates an environment conducive to academic gains, helps create an environment with fewer behavior incidents, and addresses sensory needs. Finally, participants identified the type of students they perceived as receiving the most benefit from the use of flexible seating, and in their opinion, if flexible seating was a benefit to students.

Chapter Five includes a detailed description of the use of flexible seating in elementary classrooms in southwest Missouri. Findings and conclusions based upon the

information gathered from the survey and separate school data are reviewed. Lastly, implications for practice and recommendations for future research are provided.

## Chapter Five: Summary and Conclusions

This study was conducted to examine flexible seating in the elementary classroom and its relevance to academics and behavior. The districts chosen for the study were elementary schools in southwest Missouri with classrooms that utilized flexible seating and traditional seating. Three specific schools were chosen to provide data on DRA scores and behavior incidents. These schools agreed to participate and shared the data from their third-grade classrooms.

Data were collected by conducting a survey of principals and teachers in the participating schools. The survey was designed by the researcher and sent to district superintendents to forward to elementary principals and teachers for completion. School-specific DRA data were analyzed from three districts in southwest Missouri, and tables were created to display the scores for fall, winter, and spring assessments.

### Findings

Survey questions one and two were presented to the teachers to collect demographic information. The data from survey questions three through six were analyzed to answer research question one regarding how flexible seating was used. Of the teachers and staff who responded to the survey, 63.46% had utilized flexible seating between 2 and 5 years. Only 12.05% chose to utilize flexible seating based on research.

Teachers reported using several types of flexible seating, which included stand-up tables (23.30%), yoga balls or therapy balls (25.24%), bean bag chairs (15.05%), wobble chairs (15.05%), and other seating options (21.36%). Kariippanon et al. (2019) contended flexible seating incorporates a variety of modes and methods. Hulac et al. (2020) stated stability balls or yoga balls are the most-used type of flexible seating. Since cost is an

important consideration, teachers were asked to identify the funding sources for flexible seating. Respondents received grants (17.07%), used personal funds (23.17%), asked the school to purchase (34.15%), and found other means of funding flexible seating (24.61%). Raposa (2017) maintained the use of flexible seating can be costly.

Data from survey statements and questions seven through 11 were presented to the principals and teachers to answer research question two about perceived academic, behavioral, and sensory benefits of flexible seating. The majority of the principals and teachers (86.87%) strongly agreed or agreed that flexible seating was conducive to academic gains. The overall opinion of the principals and teachers (80.61%) was that flexible seating helped to create an environment in which fewer behavior incidents occurred. They strongly agreed (90.09%) flexible seating addressed the sensory needs of students.

Principals and teachers were presented with the following question: *What population of students do you perceive as having received the most benefit from the use of flexible seating?* The findings were as follows: special education students (5.05%), students with known ADHD (15.15%), all students (73.74%), and no students (6.06%). For the final survey question, teachers shared their opinions regarding whether or not flexible seating was a benefit to students compared to their peers in traditional seating classrooms. The findings revealed that 86.36% of participants responded *yes*, and 13.64% responded *no*.

Three school districts agreed to submit DRA data from their third-grade classrooms for review to answer research question three about any difference between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and

their peers in a classroom utilizing traditional seating. There was no significant difference between the DRA scores of students in flexible seating classrooms and the DRA scores of students in traditional seating classrooms.

Three school districts also submitted data regarding the number of behavior referrals in third-grade classrooms to answer research question four regarding the difference between the number of discipline referrals for students in flexible seating classrooms and their peers in classrooms utilizing traditional seating. The data included the yearly total of referrals for each classroom and the designation of either flexible seating or traditional seating models. There was no significant difference in the number of behavior referrals between flexible seating classrooms and traditional seating classrooms.

## **Conclusions**

In this section, conclusions are presented. Conclusions were centered around responses to four research questions that directed the study. Examined in this study was the use of flexible seating in elementary classrooms in southwest Missouri based upon the conceptual framework and the work of Jensen (2005). Jensen (2005) supported the need for brain-based learning and movement in the environment.

### ***Research Question One***

How is flexible seating utilized within first through fourth grades in southwest Missouri?

A total of 107 participants responded to the survey. Data revealed that a majority (63.46%) of participants in the study had utilized flexible seating for up to five years. A small number (12.05%) decided to try flexible seating after reading research about the

model. The majority of participants chose to implement a flexible seating model after seeing another teacher utilizing flexible seating. A small number of participants implemented flexible seating after observing the use on a website such as Pinterest.

Many participants reported using a variety of flexible seating options such as stand-up tables, yoga balls, and bean bag chairs. According to Kariippanon et al. (2019), flexible seating should include a variety of modes and methods. Hulac et al. (2020) found stability balls or yoga balls are the most frequently used type of flexible seating. The funding sources for flexible seating were primarily from personal funds, from the school, or from another source. Raposa (2017) maintained the use of flexible seating could be costly.

Overwhelmingly, participants reported utilizing flexible seating based on information from teachers who were already implementing a flexible seating model. The majority of participants in the study utilized a variety of flexible seating. The preferred type of flexible seating was yoga balls or therapy balls, while a large number of teachers used a variety of flexible seating choices to meet individual student needs.

Examined in Chapter Two were the use of flexible seating in elementary classrooms and the variety of options available for teachers to choose. Zimmerman (2019) determined, “In a modern learning environment, flexible classroom spaces organically integrate technology, helping teachers to better engage students and facilitate the mix of independent, small-group and whole-group class learning that is now viewed as essential to students’ success” (p. 3). Kennedy (2019) stated, “Teachers reported evidence of increased student motivation; they noticed that students were less likely to go

off-task when they were trusted to choose a learning space that made them most comfortable and focused” (p. 23).

### ***Research Question Two***

What perceived academic, behavioral, and sensory benefits do elementary teachers and principals report as a result of implementing flexible seating in the traditional seating classrooms and special education classrooms?

Opinions of the participants in this study regarding flexible seating in the elementary classroom were positive. A majority (86.8%) expressed belief that flexible seating promoted an environment that supported academic gains. Kariippanon et al. (2020) stated, “Academic results for English, Mathematics, and Humanities for those in flexible learning spaces were higher than peers in traditional classrooms” (p. 133). Participants’ answers regarding the statement that flexible seating environments promote fewer behavior incidents were supportive of the statement, with a positive response from 79 participants (80.6%). Comparing the three districts’ data of behavior incident referrals, there was no statistical difference between flexible seating classrooms and traditional seating classrooms. Kennedy (2019) suggested the use of flexible seating increases the academic performance of students. Wright (2020) discussed students are able to focus on instruction when flexible seating is utilized.

The statement that a flexible seating classroom meets students’ sensory needs was overwhelmingly supported by participants, with 90 participants responding in agreement. Participants’ perceptions regarding what population of students receives the most benefit to the use of flexible seating was that all students benefit from its use. The data collected to address this research question were supported by Kariippanon et al. (2019), who



reported flexible seating environments employ benefits to students and teachers by encouraging engagement and decreasing behaviors. Therefore, flexible seating environments are student-centered, encourage academic growth, decrease behaviors overall, and meet the sensory needs of all students. Although participants' perceptions were that flexible seating overwhelmingly meets the needs of all students, Wejr (2018) refuted this by stating that for some, flexible seating can produce a higher quality of work, while for others, it can be a hindrance and a distraction.

### ***Research Question Three***

What difference, if any, exists between the DRA scores of students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating?

School districts' data to compare DRA scores revealed no statistical differences in scores between students in flexible seating classrooms and their peers in traditional seating classrooms. The data from three school districts were compared using a *t*-distribution scale. These data are not in agreement with individual responses to the survey on flexible seating. Participants overwhelmingly believed flexible seating encouraged an increase in academics. The belief by participants that flexible seating increases academics is supported by Lisa (2019), who stated many educators are changing their thinking to believe students are more engaged with learning and perform better when traditional seating is replaced with flexible seating.

#### ***Research Question Four***

What difference, if any, exists between the number of discipline referrals for students in third-grade classrooms utilizing a flexible seating model and their peers in classrooms utilizing traditional seating?

The participating school districts provided individual data from third-grade classrooms to compare discipline referrals of students in flexible seating classrooms with peers in traditional seating classrooms. The data were compared using a *t*-distribution scale. No statistical difference was found between the number of referrals in flexible seating classrooms and traditional seating classrooms. This information is contradictory to respondent data from the survey, where 98 participants responded. Of those participants, 68.37% agreed, and 12.24% strongly agreed that flexible seating helps create a classroom environment with fewer behavioral incidents. These data are contradictory to the individual school data provided and compared statistically. Vaznis (2017) stated, “Little research exists on whether flexible seating boosts student achievement or promotes better behavior. But anecdotal evidence from teachers, students, and parents suggests there could be a connection” (p. 4).

Flexible seating increases academic progress and decreases behaviors in the classroom because, during most of the students’ learning day, they are engaged (Brooks, 2012; Halm, 2015; Kariippanon et al., 2019; Massey et al., 2016). While participants provided positive comments and views of flexible seating, the quantitative data from the study proved otherwise. There was no statistical difference in DRA scores and behaviors between students in third-grade classrooms utilizing flexible seating and their peers in traditional seating classrooms. Sorrell (2019) discussed the perception is that flexible

seating improves learning, but there is not an adequate amount of research to support this. Hulac et al. (2020) and Wright (2020) also agreed there is limited research on the effects of flexible seating and questioned if the positive implications are due to teacher management or flexible seating.

### **Implications for Practice**

This study was driven by survey data from elementary schools in southwest Missouri and by data from three individual schools related to DRA scores and behavior incident referrals for third-grade classrooms. The educators surveyed shared positive commonalities that flexible seating classrooms support increased academics and fewer behavior referrals. These findings mirror studies that indicate flexible learning spaces encourage student engagement and improve overall academic outcomes (Kariippanon et al., 2019; Merrill, 2018; Wagoner, 2018). This study's data can be used to inform teachers and administrators in planning a learning environment with a flexible seating approach. Kennedy (2019) stated, "The goal of flexible learning spaces is to provide students with environments where they can perform to their academic potential" (p. 22). An improvement in learning and behaviors results from using flexible seating (Kariippanon et al., 2019; Ketcham & Burgoyne, 2015).

The participants in the research study reported flexible seating benefits students in the areas of academics, behavior, and sensory needs. The individual school data to compare DRA scores and behavior incident referrals between flexible seating classrooms and traditional seating classrooms did not support the survey responses from the participants. This information is valuable when planning the implementation of flexible seating classrooms and the implications of addressing individual student needs. One

suggestion would be to consider a more in-depth study comparing classrooms utilizing flexible seating to traditional seating classrooms. This could be accomplished by teachers and administrators collecting data over an extended length of time to compare flexible seating classrooms and traditional seated classrooms. Data collected should include pertinent information such as grades, benchmark assessment results, behavior referrals, and student demographics. An extension of this would be to collect data from the same students over multiple years.

Hulac et al. (2020) stated, “Research on the effectiveness of stability balls as alternative classroom seating is limited” (p. 2). Teachers should collect data on what type of flexible seating is most beneficial for addressing student needs. This can be accomplished by implementing a variety of flexible seating choices, tracking student academic growth, and using the data to determine if there is a correlation between the type of seating utilized and improved academics. Overwhelmingly, participants agreed the utilization of flexible seating met the sensory needs of all children. Therefore, another suggestion would be to implement flexible seating in special education classrooms and with students who have known factors such as ADHD and autism. Teachers then should collect daily data on student sensory stimulation in the flexible environment to determine if flexible seating decreases overstimulation.

Notably, there is limited research on the benefits of flexible seating compared to traditional seating classrooms (Hulac et al., 2020). Kariippanon et al. (2019) stated:

While acceptability of flexible learning environments is relatively high, and teachers and students report perceived benefits to teacher, learning, and wellbeing, few studies have observed flexible learning spaces in action or have

systematically documented student behavior to determine the impact that flexibility of space and mobility of technology and furniture have on space use.

(p. 3)

Leroux et al. (2021) concurred, “Although flexible classroom design has seen a resurgence of interest in schools over the past decade, relatively little research has yet focused on the practice” (para. 1).

Another suggestion would be to provide teachers with professional development on the benefits of using flexible seating. This can be accomplished by administrators allocating time for teachers throughout the year to participate in professional development activities. Professional development should be based on ways for teachers to increase academic engagement and decrease student behaviors.

Collaboration time among teachers would be beneficial for those interested in implementing flexible seating. This can be supported by the administration providing teachers with time to meet and observe flexible seating classrooms in the district and in other districts that successfully implement flexible seating. Teachers, after collaboration and observation, can share findings within their district and with teachers interested in implementation.

### **Recommendations for Future Research**

This section includes suggestions and recommendations of studies that could fill the gap on flexible seating implementation. A recommendation for future research would be to delve deeper into the positive and negative effects of the implementation of a flexible seating classroom. With the limited amount of research available, it would benefit educators to have additional research-based data to support the decision of

whether or not to implement flexible seating. With additional data supported by research, educators can make informed decisions about whether they feel flexible seating would benefit their classrooms and students.

Another recommendation would be to provide a more in-depth study with a year-long comparison of students in a flexible seating classroom compared to peers in a traditional seating classroom. A mixed-methods study detailing interviews of teachers and students, as well as student assessment data could reveal more information on flexible seating in comparison to traditional seating. While data collected in this study focused specifically on third-grade classrooms, it would be of additional benefit to expand the research to more classrooms with a similar demographic of students.

Lastly, additional research is needed to determine what student populations benefit from the implementation of flexible seating. Specifically, a future study could provide more data on students with disabilities and their response to learning in a classroom where flexible seating is implemented. This would provide insightful information on a population of students who might benefit from a classroom centered around movement and collaboration while addressing known sensory needs.

### **Summary**

Flexible learning environments promote positive academic and behavior experiences while improving academics and engagement (Kariippanon et al., 2019). Hardin (2017) stated, “Flexible seating in the classroom can help increase engagement and motivation amongst students” (p. 12). This study was designed to evaluate the use of flexible seating in elementary classrooms in southwest Missouri.

Participants included educators in school districts in southwest Missouri. The participants were sent a survey designed to elicit input on the use of flexible seating. In addition, three separate school districts provided DRA scores and behavior incident referrals for comparison purposes between flexible seating and traditional seating classrooms.

Chapter One included the background of the study, conceptual framework, and statement of the problem. The research questions were used to focus the study. The significance of the study and key terms were provided, as well as limitations and assumptions of the study.

Chapter Two included an in-depth examination of the conceptual framework of the study. The chapter also included an overview of flexible seating. Main topics of discussion included the types of flexible seating, environment, sensory needs, student learning, behavior, students with special needs, and barriers to flexible seating.

In Chapter Three, the methodology of the study was detailed. This included the problem and purpose as well as a review of the research questions guiding the study. The research design, population and sample, instrumentation, data collection, and data analysis were presented. The information presented formulated the design of the study.

Chapter Four was an analysis of the data gathered. The analysis of data was completed following a survey of teachers in southwest Missouri. Also included in this chapter were data from three separate school districts that provided DRA scores and behavior referral incident numbers for comparison between flexible and traditional learning classrooms.

In Chapter Five, findings and conclusions were presented. Suggestions were offered to guide teachers and administrators toward strategies to implement flexible seating in classrooms. Recommendations for future research were discussed.

In summary, the findings from the survey of teachers did not reflect school districts' data comparing DRA scores and behavior incident referrals. Information from the survey results showed overwhelming support of flexible seating and the benefits it provides to students. This was not supported by the individual school data provided. These findings support the need for further research on the use of flexible seating in elementary classrooms.

Lastly, it is evident from the results of this study that there is a need to address the lack of research. Kariippanon et al. (2019) stated there is a lack of research on the effects a learning environment plays on student behavior and academics, specifically a flexible learning environment. Emphasis should be placed on evidence-based research for teachers, administrators, and school districts desiring to implement flexible seating.



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Incorporating exercise and movement throughout the school day makes students less fidgety and more focused on leaning. <https://www.edutopia.org/blog/move-body-grow-brain-donna-wilson>

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## **Appendix A**

### **Sensory Friendly Environments**

According to Kelly (2015):

#### **Lighting:**

Natural light is always the best choice. In most commercial buildings, fluorescent lighting is used. With its constant flickering, it can be visually over-stimulating. If you have many fluorescents, try covering a few with a draping fabric to diffuse the sensation. If there are many windows, try to cut down the distraction by using sheer panels to allow light and decrease visual intensity. Some kids may insist on wearing their hats outside of the home to block out the intensity of the lights.

#### **Color:**

The colors used on the walls can set the tone for alertness or calmness. Think about what you are looking for in a particular environment. Alerting colors such as red, orange, or yellow may be useful in an active area, though be careful not to use too much color. Earthy, neutral tones are best for keeping over-stimulation to a minimum. Accents of blue, green, or purple can help set the tone for calmness. Be careful how many different colors are used on the walls with pictures and projects.

#### **Seating:**

Some children need good sensory input from their environment to maintain a seated position. When sitting in a chair, the feet should always be touching the floor. Because mealtime tends to be a difficult functional task for many kids, be mindful of the positioning of a highchair and try to find this same stability at a table. If your child's feet do not touch the ground, try a footstool or other item to

give the child input through his feet and improved posture. Some children are not ready for this flexed position and may benefit from standing instead of sitting. A beanbag chair or cube chair for assistance may help maintain a quiet body for an extended period of time. The child who is lying on the floor, bumping into others, or constantly moving may not have the postural control or spatial awareness necessary for the given task.

**Noise:**

Calm, soothing environments are always better for attention than loud ones. For a child sensitive to noise, a busy loud room can be a nightmare. Be aware of the child who retreats during transitions, screams at an unexpected sound, or is constantly covering his ears instead of participating. The intensity is real to him. Sound-/noise-canceling headphones and/or a quiet corner to retreat to can help with calming and regulating.

**Environment Organization:**

Visual clutter can be a challenge for a child who has difficulty processing his environment. It also presents a challenge when attempting to maneuver his body in a given space with too many objects. Balance and visual system are closely related. You may see a child not even attempt to participate when there are too many stimulating obstacles. For some children, the more visual stimulation there is, the more difficult it is to fix their eyes on the functional task before them.

**Sensory Retreat:**

It is very useful in any setting to have an environment that a child can retreat to when feeling over-stimulated and ready to withdraw or have a meltdown. This

would be an area with decreased sensations and comfortable seating – such as a bean bag chair or large floor pillows – and specific boundaries. Noise-canceling headphones and weighted objects help with calming and fidgety hands. Picture books are also good regulators for over-stimulated kids. (paras. 4–9)

**Appendix B****Flexible Seating Survey**

1. What is your role in the district?
  - a.) Regular Education Teacher
  - b.) Special Education Teacher
  - c.) Administrator
  - d.) School Counselor
  - e.) Special Teacher (PE, Art, Music, Library)
2. How long have you been teaching?
  - a.) At least one year
  - b.) 2–5 years
  - c.) 6–10 years
  - d.) 10+ years
3. How long have you been using the flexible seating model in your classroom?
  - a.) This is the first year
  - b.) 2–5 years
  - c.) More than 5 years
  - d.) I have never used flexible seating
4. Why did you decide to use flexible seating?
  - a.) Research-based design (please explain more below)
  - b.) Saw another teacher using and wanted to try
  - c.) Pinterest or other website
  - d.) Other (please explain) \_\_\_\_\_

5. What types of flexible seating do you utilize? Please check all that apply
- a.) Stand-up tables
  - b.) Yoga balls or therapy balls
  - c.) Bean bag chairs
  - d.) Wobble chairs
  - e.) Other (please explain) \_\_\_\_\_
6. How did you fund the flexible seating for your classroom?
- a.) Grant (please explain below)
  - b.) Personal funds
  - c.) School purchased
  - d.) Other (please explain) \_\_\_\_\_
7. Flexible seating helps to create a classroom environment conducive to student academic gains.
- a.) Strongly Disagree
  - b.) Disagree
  - c.) Agree
  - d.) Strongly Agree
8. Flexible seating helps to create a classroom environment with fewer behavior incidents.
- a.) Strongly Disagree
  - b.) Disagree



- c.) Agree
  - d.) Strongly Agree
9. Flexible seating classrooms address sensory needs of students.
- a.) Strongly Disagree
  - b.) Disagree
  - c.) Agree
  - d.) Strongly Agree
10. What population of students do you perceive as receiving the most benefit from the use of flexible seating?
- a.) Special education students
  - b.) Students with known ADHD
  - c.) All students benefit from the use of flexible seating
  - d.) I don't see a benefit from the use of flexible seating
11. In your opinion, do you feel flexible seating is a benefit to your students compared to their peers in traditional seating classrooms?
- a.) Yes (please explain) \_\_\_\_\_
  - b.) No (please explain) \_\_\_\_\_

**Appendix C**  
**IRB Approval**

**LINDENWOOD**  
LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

DATE: June 18, 2018

TO: Pamela Swofford  
FROM: Lindenwood University Institutional Review Board

STUDY TITLE: [1222736-1] Flexible Seating in the Elementary Classroom in Southwest Missouri

IRB REFERENCE #:  
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS  
DECISION DATE: June 18, 2018

REVIEW CATEGORY: Exemption category # 1

Thank you for your submission of New Project materials for this research study. Lindenwood University Institutional Review Board has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office.

If you have any questions, please send them to [IRB@lindenwood.edu](mailto:IRB@lindenwood.edu). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Lindenwood University Institutional Review Board's records.

**Appendix D**  
**Letter of Invitation**

Date:

Dear Superintendent,

I am a doctoral student at Lindenwood University, and I am conducting a research study as part of my doctoral degree requirements. My study is entitled *The Use of Flexible Seating in the Elementary Classroom*. This is a letter of invitation to participate in the research study. The purpose of the study is to determine if flexible seating is being implemented in elementary schools in southwest Missouri and if there is an impact on student learning and behaviors.

Participation in this research study is strictly voluntary, and you may choose not to participate without fear of penalty or negative consequences. There will be no individually identifiable information, remarks, comments, or other identification included in the study. I would appreciate it if you would forward this email with a direct link to the survey to your elementary teachers in grades one through four.

The survey should take not more than 20 minutes to complete. Participation will contribute to the current literature on the subject of flexible seating in elementary classrooms in southwest Missouri.

Link to Survey:

Sincerely,

Erin Swofford

## Appendix E

### Survey Research Information Sheet

# LINDENWOOD

You are being asked to participate in a survey conducted by Erin Swofford at Lindenwood University. I am conducting this study to determine what flexible seating is being implemented in southwest Missouri. It will take about 20 minutes to complete this survey.

Your participation is voluntary. You may choose not to participate or withdraw at any time by simply not completing the survey or closing the browser window. There are no risks from participating in this project. We will not collect any information that may identify you. There are no direct benefits for you participating in this study.

#### **WHO CAN I CONTACT WITH QUESTIONS?**

If you have concerns or complaints about this project, please use the following contact information: Erin Swofford at [REDACTED]. If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

By clicking the link below, I confirm that I have read this form and decided that I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand that I can discontinue participation at any time by closing the survey browser. My consent also indicates that I am at least 18 years of age.

You can withdraw from this study at any time by simply closing the browser window. Please feel free to print a copy of this information sheet. By clicking the link below, I confirm that I have read this form and decided that I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand that I can discontinue participation at any time by simply not completing the survey. My consent also indicates that I am at least 18 years of age, or that I have parental consent on file with the Lindenwood Participant Pool.

You can withdraw from this study at any time by simply closing the browser window. Please feel free to print a copy of this information sheet.

By returning this survey, I confirm that I have read this form and decided that I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand that I can discontinue participation at any time by simply not completing the survey. I also confirm that I am at least 18 years of age.

### **Vita**

Erin Swofford graduated from the Ava School District in 1990. Following high school, Erin attended and graduated from Cox College of Nursing, where she obtained her Associate's Degree in Nursing. She later attended Drury University in Springfield, Missouri, where she completed her Bachelor's Degree in General Studies. After completing her Bachelor' Degree, she obtained her degree in Elementary Education and began her teaching career in Ava, Missouri, as a second-grade teacher. Erin obtained her Master's Degree in Special Reading from Drury University.

After teaching for 10 years, Erin became the Process Coordinator for the Ava School District, where she served in this role for three years. She completed her Specialist Degree from Lindenwood University in 2015. Following this, she became the Director of Special Education for Ava Schools for four years.

In 2020, Erin moved to the Gainesville R-V School District, where she is currently serving as Elementary Principal.