Alternative Seating for Improved Learning in the Classroom

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Abstract

Sensory approaches that are accessible and appropriate for incorporation into the classroom may be a valuable means of providing a learning environment better suited to meet the needs of today's diverse student body. Up to an estimated 20% of general education students have sensory challenges, leading to over- or under-stimulation, which can result in difficulties with learning and behavior. Evidence-based guidance on implementing alternative seating in the classroom would benefit teachers, who are increasingly held accountable for students' success. Sensory approaches such as alternative seating have been shown to increase attention and promote self-regulation, leading to improved classroom behavior and academic performance. The purpose of this project was to create a comprehensive manual designed to make implementation of alternative seating feasible for general and special education teachers, potentially leading to improved academic performance in students. Teachers were surveyed to gain an understanding of their needs and inform our manual design and content. The completed manual was piloted to assess content learned and to guide product improvements. The project appeared successful in that all pilot teachers achieved 100% on a follow-up quiz, developing an understanding of alternative seating theory and implementation adequate enough to advocate for and implement methods independently.

Key words: occupational therapy, general education, sensory approaches, alternative seating, Response to Intervention (RtI)

Alternative Seating for Improved Learning in the Classroom

As expectations for the academic performance on standardized testing rise for students, teachers in the U.S. are increasingly held accountable for their students' achievement (AOTA, 2014b). Although research suggests a link between sensory-rich activities and increased learning ability (Jensen, 1998), funding cuts and an effort to make more time for learning testable skills are resulting in the disappearance of traditional creative, active parts of the school day, such as recess, physical education, and art (Center on Education Policy, 2008; Hayes & Wacyk, 2014). Students who are expected to spend extended periods of time sitting at desks attending to learning tasks with few movement breaks may be at risk of increased inattention and instances of misbehavior (AOTA, 2003; Wingrat & Exner, 2005). Subsequent failure to adequately learn and perform well in school may also follow (Center for Public Education, 2008), indicating a need for some type of practical classroom-based solution.

Research supports that teachers and students are likely to benefit from implementation of evidence-based and practical sensory-motor strategies that fit into the normal classroom routine (AOTA, 2003, Polcyn & Bissell, 2005). Teachers who create a multi-sensory learning environment may facilitate improved student ability to participate in the general education setting, resulting in maximized learning (Thorpe, 1985). This in turn may allow teachers to better meet the academic performance expectations set by programs such as the Common Core State Standards Initiative (CCSS). Using sensory motor strategies is one example of creating a multi-sensory learning environment.

Sensory-motor strategies such as dynamic seating, which allows the occupant to move while remaining seated, have been found to improve attention and reduce off-task and disruptive behavior in students (Bill, 2008; Fedewa & Erwin 2011; Kercood, Grskovic, Lee & Emmert,

2007; May-Benson & Koomar (2010). This has been shown to lead to an increased ability to learn in the classroom (Honaker & Rossi, 2005; Lin, Lee, Chang, & Hong, 2014; VandenBerg, 2001). Alternative seating refers more broadly to a wide variety of positions from which a student may receive instruction or perform in-class work other than traditional desks and chairs. Research indicates that alternative seating may be a suitable strategy that fits well into the general education classroom setting (Bill, 2008; Bagatell, Mirigliani, Patterson, Reyes, & Test, 2010; Fedwa, & Erwin, 2011; Pfeiffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003).

With this in mind, the project creators proposed that an accessible, comprehensive manual that educates users about alternative seating strategies and how to apply them most effectively in the elementary classroom would be a valuable tool for teachers and school administrators. This new resource has the potential to facilitate opportunities for teachers, school departments, and students to achieve success in occupational performance.

Background

The American Occupational Therapy Association's (AOTA) Centennial Vision calls for advancement of occupational therapy (OT) in promoting the diverse occupational roles of people everywhere (AOTA, 2007). One of a child's most important occupational roles is that of being a student (AOTA, 2014a). As demands for students' ever-increasing academic performance clash with funding cuts in education and larger class sizes, teachers face the growing challenge of achieving the standards laid out for them by their districts and states (Buris, 2013). Occupational therapy practitioners, with their expertise in both promoting optimal participation and in assisting those with sensory processing disorders, are equipped to deliver essential support for teacher and student success (Clark, Polichino, & Jackson, 2004).

In 2012, U.S. kindergarten through 12th grade enrollment was made up of approximately 55 million students for both public and private schools (National Center for Education Statistics [NCES], 2012). Eighty-seven percent of those students were enrolled in general education classrooms in 2012 (NCES, 2014). The average classroom size in public elementary schools in 2007-2008 was 20.3 students (NCES, 2013). With studies suggesting that at least 5-16.5% of the general population may experience difficulties in sensory processing (Ahn, Miller, Milberger, & McIntosh, 2004; Ben-Sasson, Carter, & Briggs-Gowan, 2009), one may construe that on average a minimum of four students in every classroom who have not been identified as having special education needs or requiring accommodations may be experiencing sensory processing issues. This may negatively affect behavior and academic performance not only in the child experiencing sensory challenges, but also in peers influenced by classroom disruptions and teachers distracted by challenging behavior.

OT uses evidence-based theory and practice to enhance individuals' participation in the important activities that compose their unique and meaningful roles in life, thus resulting in improved health (AOTA, 2014a). One of the chief roles of children is to be a student, and to participate in learning and social activities with peers in the school setting so that they may grow up with the best possible chance of success and enjoyment in adult roles (AOTA, 2014a). Occupational therapists act as crucial support staff in schools by assisting teachers and students in carrying out their respective roles efficiently in order to teach and learn effectively. School-based occupational therapists implement Response to Intervention (RtI) programs by observing students and evaluating their occupational performance in school activities, and can work with administration and teachers to provide interventions at each tier to improve learning (AOTA, 2012; AOTA, 2010).

Special Education Policy

Students receiving special education services are mandated to be taught in their least restrictive environment (LRE) per the Individuals with Disabilities Education Improvement Act of 2004 (IDEA 2004). This means that special education students should, to the greatest extent possible, receive education and therapies with their peers in a typical education setting. In an effort to reduce the number of students requiring individualized and costly special education classes, the RtI approach was created. RtI is a general education initiative that attempts to preemptively discover and resolve factors that may impair learning through the use of a three-tiered system that serves students at the institutional, group, and individual level according students' academic or behavioral needs (Swinth, 2014).

The first level of RtI is universal intervention aimed at the majority (80%) of students in order to prevent commonly experienced challenges from arising. An example of this is an anti-bullying initiative. The second level is a more targeted intervention directed at approximately 15% of students. For example, teachers may identify certain students who are having a difficult time with handwriting and provide them with adaptive tools that they can use in their regular classroom, such as specialized pencil grips or wide-lined paper. Teachers may consult with the occupational therapist and set up a writing group to provide extra, more intensive instruction. The third level of RtI is an intensive intervention targeted at about 5% of students in which the team identifies barriers for specific students; these students may receive intensive individualized therapy or be referred to special education (AOTA, 2014c). Educating teachers on sensory strategies that they can implement in their classroom is acting at the first level of RtI in order to support all students in academic success and prevent future challenges.

National Academic Standards

Every student, including those receiving special education services, is held accountable for their academic performance. A majority of the U.S. has implemented the Common Core State Standards (CCSS), which outlines and homogenizes what and when students learn (Herczog, 2010; Common Core State Standards Initiative, 2014). As a result, teachers are under pressure to produce greater numbers of students who attain passing grades on standardized tests (Burris, 2013). The CCSS does not address the varied learning styles, abilities, and contexts of students, leaving it to teachers and school departments to provide an educational setting best suited for academic success of all students (Common Core State Standards Initiative, 2014). Because the CCSS is a new initiative, there is currently a dearth of completed research on its effects upon teacher and student outcomes. Common media reports suggest mixed responses from educators, some in favor of the changes, others against, as well as a variety of anecdotal evidence relating positive and negative experiences (Burris, 2013; TED, 2013).

Decreased Physical Activity

Since implementation of the No Child Left Behind Act (NCLB) in 2002, 67% of U.S. school districts increased instructional time devoted to English language arts and mathematics. Forty-four percent of those districts simultaneously decreased time for other activities, including recess, lunch, and physical education (McMurrer, 2008). The human brain is not designed to attend to single stimuli or tasks for extended periods of time, with a suggested length of attention demand of 5-12 minutes for elementary school age children (Jensen, 1998). Furthermore, research demonstrates beneficial effects of physical activity on cognition and learning (Center on Education Policy, 2008; CDC, 2010; Jensen, 1998; Hillman et al., 2009). Research in neuroscience proposes that parts of the brain known to be involved in movement, such as the cerebellum, are also involved in memory and learning (Jensen, 1998). This suggests a disconnect

between expectations of students' classroom behavior and well-documented biological norms regarding learning. Allowing children to physically move about can help students refocus, maintain attention to task, and enhance cognition, as well as serve as a constructive means of sensory input (CDC, 2010). It follows that movement-based strategies may produce an improvement in productive classroom behavior.

Sensory Integration/Sensory Processing

Sensory integration refers to the way in which human beings interpret and respond to the myriad of sensations that they encounter in daily life including sights, sounds, proprioception and smell. Appropriate processing and response to sensory stimuli allow individuals to function efficiently in their environments; inappropriate responses are those which are either more extreme or less responsive than a "typical" person's response would be to a given stimulus, such as crying at the sound of the dismissal bell (Lane, Roley, & Champagne, 2014). Some students are "sensory seeking," meaning that they actively search for increased sensation. Others are "sensory avoiding," and present with adverse reactions to sensory inputs that many individuals would ignore (Lane, Roley, & Champagne, 2014). Sensory integration and sensory processing are terms that are similar in sound and which concern related concepts. However, it is important to understand that while sensory integration therapy is concerned with changing the structures and functioning in the brain that receive and manage sensation, a sensory processing approach uses external techniques to help an individual deal successfully with sensation without changing his or her neural functioning. In some cases, it is more appropriate, simpler, and effective to work to change the environment rather than the person. Neuroscience has shown that children with sensory processing difficulties process stimuli differently than typically developing children (Davies & Gavin, 2007).

Sensory processing difficulties may manifest themselves in any number of ways, including disruptive behavior and reduced ability to attend to learning tasks (Lane, Roley, & Champagne, 2014). Such consequences can also negatively affect the learning experiences of peers, who may be distracted by inattentive students, or receive insufficient attention from teachers whose energy is directed toward the disruptive student (Lane, Roley, & Champagne, 2014). The student experiencing sensory processing challenges may find that his or her own inappropriate responses to stimuli (sensory modulation difficulties) prevent him or her from learning successfully. Inability to self-regulate and process sensation effectively may also interfere with social and behavioral function (Lane, Roley, & Champagne, 2014).

Sensory Processing Disorder

Sensory processing disorder (SPD) is the common term for diagnosed impairments in sensory integration, and includes sensory modulation disorder (SMD), sensory discrimination disorder (SDD), and sensory-based motor disorder (SBMD) (Lane, Roley, & Champagne, 2014). Although SPD is not in the *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition* (DSM-5) as an official diagnosis, it is frequently accompanied by the diminished ability of students to participate fully in everyday occupations (White, Mulligan, Merrill & Wright, 2007) including school activities and learning (Miller, December 4, 2012). While SPD may be a child's sole impairment, it often accompanies other diagnoses, such as autism spectrum disorders (Kientz & Dunn, 1997) and attention deficit hyperactivity disorder (ADHD; Mulligan, 2001). In accordance with the least restrictive environment, these students may spend all or large portions of the school day in the general education classroom. With or without one-on-one support, they can create added challenges for teachers (Mulligan, 2001); however, challenges may be lessened

by providing sensory strategies, including dynamic seating (Schilling & Schwartz, 2004; Pfeiffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003).

Sensory Approaches

Sensory approaches are techniques used across populations and ages to facilitate engagement in meaningful activities, such as learning. They work by supporting the nervous system to stimulate or calm various senses to create a situation of optimal arousal—neither too high, nor too low. For example, in school it is essential that a child be alert enough to attend to sustained periods of instruction sufficient to learn that material, but not so alert that he or she is consistently distracted by irrelevant factors or disrupting the class.

Research suggests that sensory strategies can be effective in improving attention and learning in students not only receiving special education services but also in general education students (Jensen, 1998; Mulligan, 2001; Scheerer, 1991; Peck, 2005; Case-Smith, Sines, & Klatt, 2010). Sensory strategies are techniques in which particular sensory stimuli are employed to increase desirable behavior (i.e. sitting quietly and listening alertly to instruction) by providing sensory input to the child's central nervous system (CNS) (Lane, Roley, & Champagne, 2014). Strategies range from chewing gum to fiddling with a pipe cleaner. A 2010 study in a kindergarten classroom showed that students demonstrated improved attention to task when their school day included planned movement breaks (Woolworth, 2010). Students are also more likely to pay attention when seated in appropriately-sized furniture that fosters correct posture (Wingrat & Exner, 2005). Unfortunately, students require increasingly longer periods of attention, often while seated in ill-fitting desks (Cotton, O'Connell, Palmer & Rutland, 2002) and with fewer mental and physical breaks during the school day (Jensen, 1998). Incorporating sensory strategies into the classroom can allow students to optimize outcomes in their roles as students.

It is often easier or more efficient to change the environment rather than the child (Egilson & Traustadottir, 2009). Sensory strategies can be offered to students in order to make their environment, including its many associated stimuli, better meet their learning needs. Depending on the unique needs of the particular child, these strategies may include adding or removing stimuli (Densmore, 2009). Effective sensory-motor strategies include handheld "fidgets" like Koosh balls or strips of bubble wrap, oral stimuli such as gum, music that can be played during the day, and "movement breaks", in which students dance or practice yoga (Mulligan, 2001; Scheerer, 1991; Peck, 2005; Case-Smith, Sines, & Klatt, 2010). Another strategy is to provide alternative seating methods, including arranging desks so that a distractible student is placed in a quieter part of the room, or in a position where less visual stimuli are present—for instance, away from a busy doorway or activity area (AOTA, 2009; AOTA, 2010).

Alternative seating strategies include standing desks, floor seating, cushions such as the Disc 'O' Sit Cushion, and therapy/exercise balls (Pfeiffer, Henry, Miller, & Witherell, 2008). Dynamic seating, a subcategory of alternative seating, is a sensory-motor strategy that allows the individual in the seat to move and, by so doing, provide him- or herself with sensory input and discrete physical activity at will. Alternative seating options permit fidgeting and movement in place without disrupting peers, and without need for whole-class breaks in instruction, providing a viable alternative for teachers. It is essential that teachers have access to strategies that are affordable, non-disruptive, and acceptable to school administration and students' caregivers.

The goal of all teachers is to see their students succeed. Many general education instructors lack knowledge of sensory processing disorders and the ways in which to address them (Gal, 2010). Teachers and students stand to benefit from accessible, evidence-informed sensory strategies to employ in their classrooms.

Purpose Statement

The purpose of this project was to produce a comprehensive manual for elementary school educators to enable them to learn about and obtain alternative seating strategies that can be employed in the classroom in order to promote improved academic and behavioral performance in students.

Procedure

Identifying Needs of the Target Population

Creation of the manual for alternative classroom seating began with thorough research and understanding of the current needs of students and teachers in schools, including relevant legislation such as IDEA 2004 and NCLB, and what challenges educators perceive during their workdays. To make the manual user-friendly, it was important to learn what details would be helpful to teachers, their current knowledge and use of sensory strategies, and what they anticipated as barriers to implementation of alternative seating. A survey (located in Appendix A) provided to educators assisted in developing this knowledge base.

Creating the Manual

Conscientious research went into compiling the information and resources included in the manual. Because the manual aims to help teachers address sensory needs of students, gaining a strong comprehension of sensory processing theory and appropriate, evidence-based intervention methods were required to provide useful, sound suggestions. In order to provide guidance for teachers to obtain funding from outside sources, the authors researched effective methods of grant application and donation request letters, and searched the Internet for organizations and databases dedicated to helping teachers fundraise for classroom improvements. It was important for the creators to develop an awareness of the wide variety of possible seating alternatives and

how they work in order to offer suggestions on where to find them, and provide a range of appropriate options varying in price, as well as instructions for appropriate, effective implementation of these options into the classroom.

Our information was sorted into an understandable and accessible order, then transferred into Microsoft Office Publisher. Photographs of children modeling the seating suggestions were taken, edited, and used to supplement manual text. Diagrams created with Adobe Photoshop were constructed to display alternative seating arrangements for classrooms and other manual concepts. The authors wrote template letters for donation requests and to alert parents to classroom changes, and typed up a quick-reference sheet of supportive research findings to be included in the manual and to supplement letter templates.

Piloting the Manual

Once the authors assembled the manual, three volunteer teachers were sought out and provided with a digital copy of the manual in order to pilot it. They were asked to provide feedback on content, layout, and usability. They also completed a follow-up quiz (see appendix) to allow the authors to judge the effectiveness of the resource. To ensure provision of a successful product, the authors, in addition to the quiz, interviewed one of the volunteers to gain an understanding of what worked well in the sample manuals, where questions arose, and what areas needed improvement.

Skills and Knowledge Obtained for Project Completion

Required skills and knowledge to produce an effective, comprehensive manual included: Research skills, interview skills, strategies for creating surveys and analyzing results, knowledge of sensory integration and sensory processing theories, education-related laws and legislation, demands upon teachers and students, current school environments, expectations of school

administrators, expectations of parents of students, alternative and dynamic seating options and uses, strategies for introducing changes to classrooms, funding sources for teachers and schools, requirements of funding agencies or groups to obtain funding, computer word processing, design and layout skills, software use, the PEO Model, and AOTA's Occupational Therapy Domain and Practice Framework.

Product Description

In an effort to best understand the needs of teachers, the project began by perusing common media to view trends in education policy and the resulting outcomes for students and teachers. This was followed by both informal and semi-structured interviews with teachers and an occupational therapist with a school background to understand their perceptions of the evolving school environment and its demands. A survey regarding knowledge and perception of alternative seating was sent to a convenience sample of teachers known to the writers, as well as those teachers' peers. Fifteen responses were received. Most had some familiarity with sensory strategies, and had tried a few alternative seating strategies in their classrooms, such as cushions or floor-based options. Most cited concerns included misuse/abuse of seating strategies (items being thrown, used as distractions or weapons), lack of support from administrators, and lack of funding. Commonly requested information included practical strategies, methods for implementation and presenting strategies to students, and how to objectively track data.

The manual was designed to address the needs of elementary school teachers regarding all aspects of alternative seating. It includes educational material regarding multisensory learning, the impact of sensory processing disorders on students in the classroom, options teachers have regarding sensory strategies, solutions for sensory-related behaviors, as well as a complete discussion of appropriate introduction of alternative seating strategies into the

classroom. Evidence was provided to justify the use of alternative seating, and pros and cons of implementation. Resources for funding the purchase of alternative seating and a letter template for funding requests was provided along with a thorough list of alternative seating choices and cheaper or do-it-yourself alternatives such deflated camp cushions or stretch bands hooked around desk legs. Appropriate letter templates and discussion points were included in the manual to aid teachers and school administrators in presentation of alternative seating concepts and ways to keep parents apprised to current methods being used in the classroom.

Results of the follow-up quiz completed by pilot volunteers indicate than when equipped with the dynamic seating resource manual, teachers were able understand how sensory processing can affect learning outcomes of their students, and how sensory-motor strategies such as alternative seating can improve academic and behavioral performance of students. Teachers learned how to explain to administrators and parents why alternative seating is a potential beneficial addition to the classroom and how to best introduce it to their students. As a result, teachers gained new skills to improve the learning environment for their students, and increase their students' academic and behavioral abilities.

Project Goals and Objectives

Goal 1: After reading the manual, teachers will be able to justify to school administrators and potential sources of funding why alternative seating is a functional addition to the general education classroom.

Objective 1: After reading the manual, teachers will be able to independently identify a minimum of two ways in which sensory processing challenges can impair academic and behavioral performance in general education students.

Objective 2: After reading the manual, teachers will be able to independently describe at least two evidence-based ways in which alternative seating promotes academic and behavioral performance in general education students.

Objective 3: After reading the manual, teachers will be able to produce a written statement to use when advocating for funding for alternative dynamic seating in their classroom.

Goal 2: After reading the manual, teachers will be able to identify and implement alternative seating options appropriate for their classrooms.

Objective 1: After reading the manual, teachers will independently identify at least three types of alternative seating that potentially meet the needs of students with sensory processing disorders in their classrooms.

Objective 2: After reading the manual, teachers will independently describe two rules that they will present to their students regarding appropriate use of alternative seating strategies.

Objective 3: After reading the manual, teachers will independently identify one source of funding that they might access to receive alternative seating in their classroom.

The project was successful. Three out of three participants received 100% on their follow-up quiz. Goals 1 and 2 were met.

Implications for Occupational Therapy

The Person-Environment-Occupation Model (PEO) serves to illustrate the way a client's success in performing an activity or occupation—occupational performance—is influenced by unique interaction of the client's specific attributes, the specific demands of the activity, and the particular setting in which the activity takes place (Brown, 2014). Represented as a Venn diagram with three circles, one each for the person, environment, and occupation, the amount of circle overlap reflects the area in which occupational performance is strong, and the client has

success (Brown, 2014). Factors that negatively affect the client, such as a disability, injury, or maladaptive behavior would displace the circle representing the client. Similarly, a challenging change in the environment, or a change in the occupation that made it more difficult to perform, could displace those circles as well, resulting in decreased overlap, which would represent a narrow or non-existent area for occupational performance. Occupational therapists work to modify any combination of the person, environment, and occupation to produce as much "overlap" as possible and thereby optimize functioning (Brown, 2014). For this project, we are modifying the environment by introducing alternative seating into the classroom in hopes that it will increase students' attention (the person) to their schoolwork (occupation), thus enabling them to perform better in school (occupational performance). Additionally, we are also providing teachers (the person) with tools so they can better educate students (occupation).

The occupation of being a student is becoming increasingly difficult for children, just as teachers' roles as teachers are becoming more challenging. General education legislation such as the NCLB holds teachers increasingly accountable for the performance of their students at a national level. The CCSS is in line with that legislation and compares all students across the nation to the same standards, including those with disabilities (AOTA, 2014b), and often results in children being in their seats longer.

The Individuals with Disabilities Education Improvement Act (IDEA 2004) stipulates that each special education student receive educational services in his or her least restrictive environment (LRE), often referring to the general education classroom amongst that student's typically-developing peers, for part or all of the school day.

The combination of legislation directing general and special education creates a classroom environment in which there is an often-cumbersome combination of general education

students dealing with increased instruction time and rising performance standards, and special education students attempting to learn the same material in the same setting. Teachers may need added support from occupational therapy professionals to aid them in creating a setting that facilitates learning for students with a variety of needs. This is in line with the Occupational Therapy Practice Framework (OTPF), in which the occupational therapist addresses the context first through activity analysis, which may result in a decreased need for traditional one-on-one services in both general education and special education settings (AOTA, 2014a).

The RtI approach is also well suited for occupational therapists' role in school. RtI attempts to intervene first at an institutional level, providing support to all students, in order that no student fails to such a degree that he or she requires individual treatment (Swinth, 2014; AOTA, 2012). Occupational therapists are charged with the responsibility of maximizing functioning of both teachers and students in the schools (AOTA, 2014a). Increased learning standards are addressed in many schools with lengthened blocks of instruction time, creating a greater demand upon certain client factors, such as attention and arousal level, and performance skills like attending, initiating, and continuing (AOTA, 2014a). In other words, school administrators have created longer periods of time during which students are expected to sit quietly and focus on work completion. This can be an added challenge for some children as they attempt to fulfill their role as student. Extended periods of sitting can interfere with children's abilities to attend and self-regulate (Lane, Roley, & Champagne, 2014). Occupational therapists can supply strategies for helping students stay focused, for example, via alternative seating, which provides a change in the academic environment that can help some students achieve success (Schilling & Schwartz, 2004; Pfeiffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003).

While one role of occupational therapists in schools is to help students directly by supporting participation in formal education, another is to help teachers in their job performance of educating children (AOTA, 2014a). According to the OTPF, clients can be defined as a person or as a group. An occupational therapists' scope of practice extends to the systems level meaning that all education staff can be consulted to support students' learning (AOTA, 2014a). Alternative seating provides important sensory and vestibular input to children during the school day that has been shown to increase attention and reduce disruptive behaviors in students with and without diagnosed learning disabilities (Schilling & Schwartz, 2004; Pfeiffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003; Jensen, 1998; Al-Eisa, Buragadda, & Melam, 2013; Mulligan, 2001; Bagatell, Mirigliani., Patterson, Reyes, & Test, 2010). Providing a comprehensive manual on the benefits of alternative seating that includes an exhaustive supply of information on the reasons for seating alternatives, obtaining alternative seating, and implementing it, would improve teachers' abilities to create a learning environment that meets the demands of the greater education system and their local school while minimizing environmental and situational challenges for students.

Limitations and Considerations

During the course of reviewing the literature, researching the population needs, creating the manual and piloting it, and reflecting on the process, several limitations were identified which suggest future improvements and considerations.

Limitations of the Project

Utilizing a small population size for the survey limits the generalizability of the results, and may also have limited the scope of the needs the manual addressed. Due to the convenient nature of the sample, a large amount of feedback was provided from special education teachers.

Feedback may have varied if received from a greater amount of general education teachers. This may have resulted in a product that is less specifically created for our target population of general education teachers. Extending the survey to a broader number of participants and selecting only general education responses for analysis may be a worthwhile future undertaking. Furthermore, survey results were not statistically analyzed for the purpose of this project, and more objective data may better inform future versions of a similar manual.

Limited time to analyze the survey results, complete compilation of the manual, and respond to the results of piloting suggests that additional trials of the post-pilot version of the manual may allow further improvements and lead to better outcomes. It would be beneficial to study the efficacy of the manual on a more long-term basis. For example, it would be informative to see what success teachers had if they were to track classroom data before and after implementation of alternative seating strategies as directed by the manual.

The literature review was written as completely as possible, but given the relatively recent nature of such changes to the field of education such as implementation of the Core Curriculum, there is a lack of evidence-based research into the effects of such policies on teachers and students. Similarly, sensory processing theory is still in the early stages of scientific investigation, and it is likely that understanding of sensory strategies will change and develop considerably in the near future. Many studies have been done on the effects of alternative seating and sensory strategies on the individual level, however there is a lack of research regarding the outcomes of sensory approaches implemented on a systems level. Research also continues in the area of neuroscience, and will affect our understanding of learning and sensory processing. New research must be sought out and weighed carefully to inform later versions of the manual and its content.

As people turn more to the internet and digital resources for answers to questions and solutions to challenges, producing a hard paper manual begins to sound outdated. Future versions of the manual ought to consider a digital format to increase accessibility, especially as new generations of teachers accustomed to fulfilling their needs via computer enter the field.

Sustainability and Recommendations for the Future

Given the positive outcomes of this project, it appears that increasing teacher awareness of how to create an optimal learning environment for their diverse student bodies is beneficial for successful teaching and successful learning. Resources that are accessible and comprehensive can provide them with the background knowledge and skills to implement alternative seating strategies effectively. This manual is a valuable wealth of content, and it is recommended that it be made available to more teachers in order to effect improved academic performance and school behavior amongst students in a wide variety of locales. A digital copy of this thesis paper is available via the University of Puget Sound (UPS) Collins Library website. The manual content in Microsoft Office Publisher has been left with the University of Puget Sound occupational therapy department to be dispersed as seen fit by the department. The survey has also been left to the UPS OT department, and may be used for more rigorous research and analysis at a later date.

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Appendix A

Alternative Seating Survey

Thank you for taking time to answer the following questions. Our thesis project is to develop a manual to help teachers learn how to implement alternative seating strategies in their classrooms. Alternative seating is believed to help some students learn more effectively.

1. According to research, sensory processing refers to a person's behavioral response to incoming sensation (sight, sound, smell, touch, taste, movement). We are all unique in our level of processing. Some people seek sensations and others avoid. How much do you feel you know about sensory processing?
   - A lot
   - Some
   - A little
   - None

2. Research suggests that sensory strategies can help improve attention and learning in children. Examples include movement breaks, dancing, fidgets, gum, music, sucking on straws. How much do you feel you know about sensory strategies?
   - A lot
   - Some
   - A little
   - None

3. Dynamic seating is a specific type of sensory strategy. It includes exercise balls, cushions. How much have you heard about dynamic seating?
   - A lot
   - Some
   - A little
   - None

4. Alternative seating is another type of sensory strategy. It includes standing desks, sitting/lying on the floor, or arranging furniture in a specific way to control sensory input. How much do you know about alternative seating?
   - A lot
   - Some
   - A little
   - None

5. Have you tried using dynamic or alternative seating in your classroom? What types?
   Please check all that apply.
   - Yes, I've tried cushions
   - Yes, I tried standing desks
   - Yes, I've tried rearranging the furniture
   - Yes, I've tried having students sit/lie on the floor
   - No, I have not tried alternative seating strategies.
   - Other

6. Do you experience difficulties in your classroom related to "wiggly kids" (inattentive, distracted, disruptive)?

- This happens regularly
- No difficulties

7. Do any of your students appear underaroused (too tired, bored, laying head on desk)?
   - This happens regularly
   - This happens occasionally
   - No difficulties

8. How does overaroused or underaroused activity seem to affect your students?
   Please briefly describe.

9. Are you concerned about how your students' performances on standardized tests reflects upon you as a teacher?
   - I'm very concerned about this.
   - I'm somewhat concerned about this.
   - I have no concerns about this.

10a. Have you tried any sensory strategies (such as fidgets, dancing, yoga, therapy ball seating, etc.) with students before?
   - Yes.
   - No; continue to Question 11.
   - I am not sure.

10.a. If YES on Question 10, what type of strategy or strategies did you try?

10b. If YES on Question 10a., did you try strategies to primarily:
   Please check all that apply.
   - Calm or quiet students
   - Arouse or "wake up" students
   - Both calm and arouse students

10c. If YES on Question 10a., how did the sensory strategies work?
   Please check all that apply.
   - They worked well.
   - They worked a little.
   - They did not work.
   - Other:

11. What does the set up of your classroom currently look like?
   - Desks are in rows facing the area from which I teach.
   - Desks are in groups facing various directions.
   - Other:

12. Where do your students spend most of their time for reception of instruction and for completion of work?
   - At their desks.
   - At various stations in the classroom.
   - Students are allowed to choose where they work.
   - Other:

13. What concerns do you have about implementing alternative seating in your classroom?
   Please check all that apply.
   - Kids might misuse/abuse strategies and become more disruptive or off-task.
   - Parents or other school staff will not approve.
   - I will be distracted by my students moving around while I am teaching.

- I don't know how I will fund this or I will be expected to fund this out of my own pocket.
- I am not sure how to effectively implement a sensory strategy.
- I have no concerns.
- Other:

14. What resources do you have available for funding classroom changes?
    - I have access to school funding.
    - I know of outside funding sources (community, etc.).
    - None.
    - Other:
15. What information would you find useful in a manual on implementing alternative seating in the classroom?

    Please make a few notations.
16. What type of setting do you teach in?

    Please check all that apply.
    - General education classroom.
    - Special education classroom.
    - Other:
17. We would appreciate any other comments or questions you have related to the role of alternative seating in the classroom.

Appendix B

Alternative Seating Survey

Please take a few minutes to fill out this "quiz" after you have read the manual on alternative seating.

1. What are two ways in which sensory processing challenges can impair academic or behavioral performance in students?

2. Describe two reasons that alternative seating can help academic and behavioral performance in students.

3. Imagine you are talking to a school administrator or potential donor about alternative seating. Briefly describe why alternative seating might be a beneficial addition to your classroom (1-2 sentences).

4. Identify three alternative seating strategies (retail or do-it-yourself) appropriate for classroom use.

5. Describe two rules you would tell your students about when using alternative seating.

6. Identify one external source of funding that may be available to you for alternative seating.

Thank you so very much for your time, feedback, and energy! Christie & Alexia

Appendix C

Sample Manual Pages

How do sensory strategies help with classroom behavior?

Current research suggests that there is a link between sensory-rich activities (activities that involve multiple senses) and learning. There also appear to be relationships between the parts of the brain involved in memory and in movement. Further, research shows better learning results when the student is also doing activities requiring physical movement. (Jensen, 1998; Thorpe, 1985). When a person sits quietly for an extended period, fidgeting can be a natural means of the body and brain working together to stay alert. It becomes a problem when it is disrupts the teacher or other students. However, keeping students from fidgeting may, for some, lead to underarousal, sleepiness, and inattention. Alternative seating strategies, such as using a standing desk or an exercise ball instead of a traditional chair, allow for small amounts of movement and provide extra proprioceptive and vestibular input during otherwise quiet activities. Movement is within the student's control, and done in a way that can be accomplished simultaneously with listening or working on an assignment without disturbing peers or the teacher.

Sensory strategies work to help individuals compensate in a socially- acceptable manner for problems in the way they process and respond to sensory information. Sometimes a child's negative behavior is really their body's way of saying that their brain is receiving too much or too little sensory input. For example, a child who has a hard time focusing quietly and attentively when a teacher is instructing, without being distracted by a fly in the window or a student passing in the hallway, may benefit from having an inflated disc cushion to sit on. This would allow him to move discreetly in his seat, and help him maintain a level of arousal high enough to remain alert and attentive, but not so high that he is inclined to leave his workspace or touch a nearby peer. While they may not be a magic bullet in solving behavioral or academic challenges, sensory strategies can help bridge the gap between a child's ability to handle and respond to incoming sensory information and his or her behavioral expectations. (Lane, Roley, & Champage, 2014; Jensen, 1998).

Alternative Seating: A Valuable Sensory Strategy

Alternative seating refers to a broad range of strategies for changing the physical position from which children learn at school. Dynamic seating is a sensory-motor strategy that allows the occupant of the seat to move and therefore provide him- or herself with vestibular, proprioceptive input and discrete physical activity at will. These options permit fidgeting and movement in place without disrupting peers, and without need for whole- class breaks in instruction, providing a viable alternative for teachers. Dynamic seating strategies have been found to improve attention and reduce off-task and disruptive behavior in students. Research indicates that alternative seating, including dynamic seating, may be a suitable strategy that fits well into the setting of general education classroom. (Pfieffer, Henry, Miller, & Witherell, 2008; Schilling, Washington, Billingsley, & Deitz, 2003)

Due to the frequently-fluxuating costs and availabilities of items, we did not include prices in this manual. Some retail selections cost hundreds of dollars, while some of the do-it-yourself versions can be found at your local dollar store, and the rest are anywhere in between. However, most can be found online at Amazon or via a Google search.

Types of Alternative Seating

Cushions allow small amounts of movement and increase proprioceptive and vestibular input. Some encourage better posture, which also helps children

engage.

They are also portable and fairly discrete.

- ∗ Disc 'O' Sit
- ∗ Gaiam Balance Disc
- ∗ CoreDisk
- ∗ FitBALL Seating Disc
- ∗ Gymnic/Movin' Sit Jr Inflatable Wedge Cushion
- ∗ Can Do Child Inflatable Sitting Wedge

Do it Yourself!

- ♦ Old gym balls partially deflated
- ♦ Camp cushions
- ♦ A couple layers of large or small bubble wrap
- ♦ A throw pillow case stuffed with packing peanuts or foam chunks

Fair Versus Equal

You may find the following illustration helpful in teaching your students why not everybody needs an alternative seating method to help them learn. Some children are successful in traditional chairs and desks, while others need something different. Imagine three spectators watching a soccer game over a fence. One spectator is tall enough to see over. The second spectator is short, and cannot see; the third is in a wheelchair and also cannot see. Imagine all of the spectators get a small box underneath them. The tall spectator didn't need one but can still see. The short one can see, but the one in a wheelchair still cannot see over the fence. That is equal, but not fair. Imagine now that the tall spectator has no box, the short spectator has a small box, and the spectator using a wheelchair has a big box. That is not equal, but it is fair; this can also be described as justice.

Equal, but not fair.

Equal, but not fair. Fair, but not equal.