Simple Sensory Strategies for Future Educators

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Abstract

The purpose of this project was to develop a process for sharing about sensory strategies with future educators. The in-service that was created was implemented with education students at Pacific Lutheran University (PLU) in Tacoma, Washington. The in-service presented future educators with a background on Individuals with Disabilities Education Act of 2004, Response to Intervention, Common Core Learning Standards (CCLS), sensory processing, sensory processing disorder, sensory strategies for the classroom, and resources to support the use of sensory strategies within the classroom. The Alert Program®, by Sherry Shellenberger and Mary Sue Williams (1994) was used as a specific example of a way to incorporate sensory strategies into a classroom and was used as an organizational structure for the layout of the in-service. The Alert Program® helps individuals understand and select strategies to help alert their body and brains. The current curriculum for future educators does not include training on sensory processing, or address sensory strategies teachers can use to impact the effectiveness of increased seated learning time for students. To develop an understanding of the importance of sensory strategies, it was first necessary to explore the future educators' individual sensory processing preferences. In a pre-survey, 18.6 % of the in-service attendees indicated they have sensory processing preferences, while in a post-presentation survey, 97.6 % of students identified they have personal sensory processing preferences. Following the in-service, 93 % of participants reported they were planning on implementing sensory strategies in their classroom. Using sensory strategies may facilitate focused learning and assist with meeting CCLSs, allowing all students to better regulate their sensory needs (Jensen, 2000). It appears the goals for the in-service were met by increasing awareness of sensory preferences and sensory strategies amongst future educators, by initiating a potentially on-going collaboration between the occupational

therapy department at the University of Puget Sound and the school of education at PLU, and by

producing a CD with materials and instructions that would allow occupational therapy students

to easily present this information in the future.

Introduction

In an ever-changing educational climate, schools, teachers, and professional service specialists attempt to reconcile requirements set by national laws, state regulations, and school districts with the needs of schools, classrooms, and individuals students. Educators must be informed about the policies, approaches, and resources available to assist a diversifying student body. Changes are taking place within children, the academic day, and the expectations for student and teacher achievement set by education legislation (Graham et al., 2003). Educators need to be aware of the diversity of learning styles and abilities within the classroom, including sensory processing challenges, which can influence learning outcomes.

Sensory processing, which is the body's ability to filter and organize sensations (Brown & Dunn, 2010), allows an individual to function effectively in the world. Sensory strategies can be used to help calm or alert an individual; as an example, a person that is lethargic or low energy may benefit from brighter lighting, or a person that is high energy that needs to calm down may benefit from softer, dimmer lighting. Developing an understanding of sensory processing and the effectiveness of sensory strategies may help general education teachers implement Common Core Learning Standards, which are national learning goals for which each child should be able to do at their grade level, and facilitate successful student habits.

Universities are preparing future educators to enter classrooms as leaders in the field of education. However, what was once considered general education population with classrooms of "typical" children is diversifying. As a result, legislation and policies are changing, encouraging teachers and professional service specialists to work together to provide students with support on a tiered continuum, preemptively, before students fail (Whitten, Esteves, & Woodrow, 2009). Occupational therapists have the opportunity to influence entire classrooms through

collaboration with educators and educate on utilizing a sensory processing frame of reference to focus on how bodies and brains respond to and regulate sensory input (Brown & Dunn, 2010). Some children within the general education classroom may have challenges with sensory processing and have not been identified as having special needs. These children may find it challenging to successfully participate in a classroom not well suited for their needs.

For this project, students from the University of Puget Sound (UPS) shared knowledge about education legislation, sensory processing, and sensory strategies with future educators at Pacific Lutheran University (PLU). As a result of the inservice, the future educators may better understand the resources, challenges, and reality of the educational climate they will soon enter. Based on this collaboration, future educators may be better equipped to select solutions that match their school, classroom, and individual students. Learning about sensory strategies may prepare teachers for the, not so general, general education environment.

Background

Today's Students

Society is changing with increasing prevalence of technology, increasing concerns for safety, and less time for unstructured play. This new environment is changing children's physical and cognitive development. Media and technology are affecting children's social and communication development. Children acquire electronic games, personal computers, and cell phones at increasingly younger ages. Surveys indicate about 82 % of children are online by seventh grade and experience about six and a half hours per day of media exposure (Coyle, 2009). These changes are reflected in the attention, attitude, and expectations of students within the classroom and as learners. Children are becoming accustomed to shifting their focus at very short intervals, which becomes problematic when faced with tasks, such as standardized tests, that require a student to stay seated and focused on one task for up to 90 minutes (Coyle, 2009).

Changes to Academic Schedule

Teachers have an increased quantity of responsibilities as well as an increased amount of classroom material to cover to meet core learning standards. Less school time is allocated for recess, physical education, art, and music, to create more time for covering test-related content (Graham et al., 2003). Removing less structured physical activities to devote time to learning standards may be detrimental to children's physiologic needs. Despite evidence that students in schools with art, music, and physical education perform better on standardized tests, these special subjects are being reduced and sometimes eliminated (Graham et al., 2003).

Participation in recess, physical education, art, and music is not a privilege; recess participation is something a growing and developing body and brain needs to be successful in academics (Graue, 2011). "Learning content is inherently intertwined with other elements like

motor skills, aesthetic experiences, and social-emotional development. In an increasingly

sedentary, structured context, students have few opportunities for rich experiences of moving,

creating, or interacting" (Graue, 2011, p. 15). These rich experiences engage the senses which in

turn, alerts or calms the body. Sensory strategies are tools and approaches that can be used to

help calm or alert an individual; examples include, interspersing movement breaks throughout a

lesson plan helps to engage/alert a student's body, while humming a tune together as a class can

help calm the energy and focus the attention of a class (Jensen, 2000). Understanding the needs

of the whole body and simple sensory strategies can help assist educators find ways to elicit

focused learning in classrooms filled with an ever-increasing diversity of learners (Swinth,

2013).

The Not So General General Education Classroom

Within the education population, students can no longer be described as simply "general"

or "special" education. New models to understand learning have emerged that promote the

concept that there are no 'types' of students, but a range of learning styles on a continuum

(Stainback & Stainback, 1984). The Individuals with Disability Education Improvement Act

(IDEA 2004) ensures all students receive a full, inclusive learning experience in the most natural

environment (IDEA, 2004). This means more students with needs outside of the general

education teacher's training could potentially be participating in the general education classroom.

Skilled teachers increase the academic success of all students by "weaving into their

instructional routine an appropriate array of class wide curricular accommodations," (Wright,

2013, p.1). Accommodations, including instructional or environmental adaptations, such as

headphones to cancel out distracting sounds when working, or handheld fidgets or weighted lap

pads to calm a child and allow them to focus. Having such accommodations available can assist students to appropriately regulate their unique energetic and sensory challenges (Wright, 2013).

Individuals with Disabilities Education Improvement Act

The IDEA 2004 is the current manifestation of what was the Education of Handicapped Children Act (EHA) of 1975 (Whitten et al., 2009). The act states that schools are required to meet the unique needs of children with disabilities in the most natural environment (Whitten et al., 2009). Initially, the strategy to meet the needs of children with disabilities was to remove them from the general classroom and offer separate instruction. This occurred until the inclusion movement of the 1980s, which promoted the reintegration of children with disabilities into the general education classroom. With the advent of reintegration, a new model was established in which individualized instruction for the students was postponed until the point of the students' failure; this was termed the discrepancy model (Whitten et al., 2009). IDEA 1997 was reauthorized, allowing for a change to the intervention approach.

With the reauthorization of IDEA in 2004, schools were allowed to utilize 15% of IDEA 2004 funds on early intervention efforts (Whitten et al., 2009), which means funds are available to provide help to students as soon as they need it. This possible re-designation of funds allowed districts to support a new intervention approach: Response to Intervention (RtI). RtI is a model designed in response to the 'wait to fail model', which attempts to remedy discrepancies in learning as early as possible (Whitten et al., 2009).

Response to Intervention: RtI

RtI is a tiered assessment and intervention process designed and implemented with the intent to provide research-based, individually focused instruction for each student (Whitten et al., 2009). The model involves three tiers. The first tier centers around classroom-wide instruction,

broadly available accommodations, or adaptation with universal screenings/assessments to understand the needs of each student. The second tier provides specific supplemental instruction or accommodation by targeting needs and strengths of students and monitoring individual student's progress. In the third tier, intensive instruction and guidance is provided in small groups or in a one-to-one context. Within RtI, the levels of instruction "are progressively more intense based on the child's response to instruction," (Office of Special Education Programs, 2007, slide 24). In RtI terminology: accommodations are organizational or instructional changes in the classroom structure that support student participation, interventions are strategies to change students' learning outcomes, and modifications are alterations to curriculum and assessments that create a learning environment for a specific student (Missouri Department of Education, 2014). RtI is designed to be preventative and limit the requirement to document failure before a student receives specialized supports. Thus potentially limiting the number of special education referrals.

Providing sensory strategies through accommodations may be one strategy to make changes to the environment or daily classroom routine while continuing to include the student in general education classroom instruction (Missouri Department of Education, 2014). For example, incorporating dynamic seating options may allow students to move during seated learning time in less distracting ways. This could allow student's bodies to receive input from their muscles and joints which may assist them in attending to their academic tasks and limit the amount of behavioral disruptions that may occur without the dynamic seating accommodation. The first step towards making systematic changes within the schools and classrooms is educating teachers and administrators about sensory preferences/sensory processing (Hollenbeck, 2007). It is essential to share the knowledge and provide a context when exploring barriers that impede,

and supports which assist students in meeting learning standards, which are the official

measurements of academic success.

Common Core State Standards

The National Common Core State Standards for learning are in place for all students

(kindergarten-12th grade) in the public education system. Common Core State Standards (CCSS)

track student academic progress, and standardize content taught in the classroom. Meeting CCSS

is essential for the student to pass through the education system (Office of Superintendent of

Public Instruction, 2013). Not only are teachers pushed to meet CCSS but the No Child Left

Behind legislation requires that all students improve or meet standards in education. Teachers

are being held accountable for students failed achievement (No Child Left Behind [NCLB],

2002). Important questions must be posed as to what is inhibiting learning and success in the

classroom. Are there support services that are not being considered to boost achievement?

Understanding learning from a more holistic perspective may assist teachers in considering new

approaches to instruction. The needs of the developing brain and body are intricately explored

within the sensory processing/integration framework and may assist in the understanding and

evaluation of supports and barriers in general education classroom learning (May-Benson &

Koomar, 2010).

Sensory Integration and Sensory Processing Theory

A. Jean Ayres (1979) is a pioneer in sensory integration theory, which was foundational

to the development of sensory processing theory. As perceptual motor theories were unable to

explain certain learning deficits, sensory integration theory was developed theorizing that

successful integration of input from the senses is foundational for growth and development

(Schaaf et.al., 2010). Ayres believed that developmentally, people begin to orient against gravity

and the physical world by developing their vestibular system and progressively learn to filter and organize other senses. The human nervous system registers, filters, combines, and responds to sensory information (Ayres, 1979). The proprioceptive system (which registers body position) and vestibular system (which registers head movements and balance) are two, often-unrecognized, bodily senses help us orient to our world (Ayres, 1979). These senses support the development of posture, balance, muscle tone, and coordinated movement (Schaaf et. al., 2010). Ayres postulated that motor, language, and cognitive development are reliant on successful incorporation of sensory input (Ayres, 1979).

Winnie Dunn took the work of Ayres and further developed the theory of sensory processing which postulates about the interaction behind neurological thresholds and behavioral responses (Brown & Dunn, 2010). "Sensory processing refers to how the nervous system receives messages from the senses and turns them into appropriate motor and behavioral responses" (Sensory Processing Disorder Foundation (Sensory Processing Disorder Foundation [SPDF], 2013). Processing patterns vary depending on the amount of sensory stimuli the individual needs in order to elicit a response (Brown & Dunn, 2010). Sensory Processing Disorder (SPD) is a condition where sensory signals do not elicit the appropriate response (SPDF, 2013). Surveys indicate "at least one in twenty people in the general population may be affected by SPD," (Miller & Fuller, 2007, p. 249). SPD is a disorder often comorbid with autism, and hyperactivity disorders. Stanley Greenspan and Serena Weider (1998) found that 94% of children on the autism spectrum had sensory processing challenges. Seventy percent of children with learning disabilities have been found to have sensory processing challenges (Moyes, 2010), including problems with modulating their response to sensory input. Sensory modulation dysfunction (SMD) is a type of processing disorder in which children are unable to appropriately

register the nature or degree of intensity of the sensory input and create a matching response (Brown & Dunn, 2010). An example would include a person over responding with aggression or withdrawing to a tap on the shoulder. Five to fifteen percent of children in the general population demonstrate difficulties with sensory modulation," (Reynolds & Lane, 2008, p. 516). These children have no official diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) (American Psychiatric Association, 2013), which is the American Psychiatric Association's classification and diagnostic tool, but may exhibit symptoms related to sensory processing that may not meet the criteria to warrant a diagnosis. These children may require supports within the classroom to be successful for focused learning.

The general education classroom is no longer "general," and a change to the approach of working with all students needs to be made. Occupational therapists within the schools can help implement classroom and school-wide strategies collaborating with teachers and increasing environmental supports for children with sensory processing issues (Swinth, 2013).

Occupational Therapy in Schools

The EHA of 1975 mandated public schools provide "free and appropriate" education for all students; previously, students with disabilities had been educated in private "special" education schools. With this mandate, occupational therapist and other specialists entered the public schools to support the education of children with disabilities ages 3-21(Chandler, 2013). Occupational therapists' focus in the schools was initially on improving, developing, and restoring function and preventing further impairment for individual students with disabilities (Chandler, 2013). Over time, school occupational therapists' focus has shifted away from a medical model to a focus on becoming leaders in implementation of systematic supports for children with disabilities within the schools. Part of occupational therapists skill sets to be

effective leaders includes training in observation, activity, and environmental analysis skills that

aid in their expertise to design successful learning environments (AOTA, 2012).

In 1990, the EHA was changed to IDEA, which has been amended twice and

reauthorized once since its inception. Every stage of the development of IDEA has increased its

emphasis on accountability of the school and on the performance of the student; most recently,

the focus of the reauthorization of IDEA 2004 was to support the professional development of

expertise and the ability of teachers and school personnel to educate students with disabilities

(AOTA, 2012).

IDEA 2004 provides schools more options to support struggling students before referring

them to special education (Jackson, 2007). This is known as, early intervening services (EIS),

that allows school districts to use a portion of IDEA 2004 funds preemptively to support

struggling students K-12 with related services (Jackson, 2007). This provision, ideally, allows for

occupational therapists to develop and deliver services and supports for a broader range of

children. Some districts use RtI, a systematic approach to monitor and to proactively support

struggling students. Within the three tiers of RtI, the education team provides a continuum of

services to students. The occupational therapist, as part of the education team, educates and

collaborates with the teacher to develop a tiered approach to intervention and strategies to meet

the unique needs of students and provide support before it is necessary to make referrals to

special education. The goal is to enable individuals with disabilities to participate fully in their

natural environment.

A "2010 Occupational Therapy Compensation and Workforce Study found that school-

based practitioners spent 62 % of their time providing direct client intervention and 34.4 % of

their time on indirect intervention, administrative work, and/or consultation" (AOTA, 2012).

However, it is becoming increasingly difficult to remove students from the general education classroom because of the high expectations for learning set by NCLB and the CCLS (Swinth, 2013). It is essential for occupational therapists to begin to integrate strategies into the classroom to allow students to remain in the classroom and participate in learning. Integrating sensory strategies into the school routine is one support that occupational therapists can help to implement school-wide, classroom-wide, and for individual students.

Educating teachers and administrators can be part of the broadest, school-wide, first tier intervention of RtI. Sensory strategies can be implemented school-wide to help a wide range of students, this would likely address learning challenges early on before more intensive individualized instruction is required. Occupational therapists can teach the relationship between "sensory processing, learning, and behavior"(American Occupational Therapy Association [AOTA], 2003), assisting teachers in making modifications to classroom environments that may provide more options and supports for students to self regulate their energetic and sensory needs. The modifications include sensory strategies, which are tools and tactics to help individual's stay calm, focused, and organized for their role as a student. Examples of sensory strategies in the classroom can include water bottles for sipping, putty to manipulate, seat cushions for seated movement, or movement breaks to provide proprioceptive feedback to calm restless bodies. Additional examples of sensory strategies can be found in Appendix B. These classroom modifications may "prevent inattention, poor posture, and restlessness" (AOTA, 2003) and lead to better academic outcomes.

Teachers who understand sensory preferences may make modifications to the classroom environment or to the daily routine to support the sensory needs of students and their unique abilities to regulate their nervous systems (SPDF, 2013). In turn, students will have more options

available to regulate their sensory needs, which will likely translate to less inattention, restlessness and poor posture (AOTA, 2003) and more appropriate adaptive motor and behavioral responses (SPDF, 2013) leading to better academic outcomes. The classroom environment has the flexibility to allow for changes and adaptations to address individual learning needs based on an understanding of the way bodies learn, is essential for making these changes successful. Collaboration between disciplines, working to understand the complexities of human learning, can assist in the creation of new adaptive learning environments (Swinth, 2013).

Strategies to Support Student Learning

There is no one way for the mind to learn, and there are many elements of the human body to consider when teaching (Jensen, 2000). Understanding why occupational therapists frequently focus on the how individual children register and process sensation begins with understanding the evidence behind sensory strategies. Evidence behind the strategies continues to be tested and explored. Many researchers and therapists are implementing programs that explore and in turn support the efficacy of movement breaks and sensory strategies; the ATEACHABOUT program and the Alert Program® are two programs based on sensory processing/integration theories.

Evidence behind sensory strategies. There is strong evidence of plasticity within the nervous system. This plasticity is positively influenced by motor and sensory experiences (Arbesman & Lieberman, 2012). Studies in neurophysiology have found that "enrichment consistently alters brain structure and motor performance" (AOTA, 2013). Changes are more profound with increased interaction with one's environment (AOTA, 2013). The ideal amount and quality of interaction with the environment will vary depending on the needs of the

individual student. The use of sensory strategies increases and adds a layer of complexity to students' interaction with their learning environment and therefore likely supports their engagement and development.

In 2004 an ABAB research study was conducted by Schiling & Swartz, in which, boys age 3-4 were individually fitted with yoga balls with moulded feet as a dynamic seating option. The results of the study indicated that the use of this dynamic seating option increased in-seat participation and on-task behavior (Schiling & Swartz, 2004). Lin, Min, Chou, and Lin (2012) compared the activity level of an intervention group of 18 children, ages three to six, compared to a control group. The intervention consisted of the use of graded accommodations which engaged the vestibular, proprioceptive, and tactile senses. During intervention, the group displayed decreased hyperactivity levels, and fewer distracting foot-swinging episodes. More research is needed; however, this study concluded that sensory processing strategies integrated into the curriculum, may lead to positive classroom behavioral outcomes (Lin et al., 2012).

The importance of movement. Neurobiologist John Medina (2009) claims that due to how we evolved as a species, the optimal environment for learning is motion. Movement increases blood flow and therefore oxygen flow to the brain, which increases mental acuity (Medina, 2009). Therefore, incorporating movement in the classroom may assist children in increasing attention during focused learning. Movement breaks, involving the body and proprioceptive system, are a great option between seated learning sessions. Yoga poses, animal walks, or movement routines increases blood flow, and may have a positive effect on students' focused learning.

Creating New Spaces. Diana Henry is an occupational therapist who travels the country helping schools implement sensory strategies in the classroom to help children increase focused

learning time through her ATEACHABOUT program (Muroff, 2008). Henry helps classrooms incorporate four different types of sensory spaces, including the womb space, which provides a quiet, calming, and lowly lit environment; the mother space, which allows children to work collaboratively on the floor engaging tactile and proprioceptive systems; the brain power space, which promotes interactive thinking; and the kid power space, where children can self-regulate by testing their bodies against gravity and moving around in less structured ways (Muroff, 2008). Henry's program is one of several developed programs for classroom sensory strategies.

The Alert Program®. Two occupational therapists, Mary Sue Williams and Sherry Shellenberger (1994), have created The Alert Program®. Through participation in this program children learn to analyze and articulate the needs of their arousal systems, when describing how their "engine runs" (Williams & Shellenberger, 1994). Children learn to identify when their bodies are "a high engine", meaning they are hyper, restless, or have trouble sitting still; or when their bodies are "a low engine", meaning they are lethargic, or it is difficult to energetically engage (Williams & Shellenberger, 1994). Children then learn their body is "a just right engine" when they are alert, able to pay attention, and are ready to learn or play. The Alert Program® promotes and teaches individualized sensory strategies for individuals to calm or alert their bodies so they can get to a "just right" place to learn. Occupational therapists can train teachers with this approach to identify individual energetic needs in the classroom, and offer solutions for student's energy regulation (Williams & Shellenberger, 1994).

An exploratory project evaluated an eight week long trial of The Alert Program ® in a classroom for children with emotional disturbances. Teachers' perceptions indicated that The Alert Program® improved students' ability to self-regulate, focus on or change tasks, organize themselves, and cope with sensory challenges in the classroom (Barnes, Vogel, Beck,

Schoenfeld, & Owen, 2008). Training teachers on the strategies available for the classroom may be a proactive approach towards assisting students with developing awareness of their needs, and appropriate ways to satisfy their needs.

Teacher Training

With increasingly diverse general education classrooms, teachers need training and preparation to meet the variety of student needs. The school of education at Pacific Lutheran University (PLU) strives to pursue excellence by fostering "high levels of competence, as we continually revise our curriculum and pedagogical approaches to reflect the latest demands within the field" as well as promote "high levels of leadership and, as a result, we focus on helping our students gain the skills and orientations to affect change within schools" (Pacific Lutheran University, 2013). Currently, the curriculum at PLU does not include education or training on sensory processing. Understanding sensory processing and the needs of the whole body in learning will assist future educators in determining best practices that respect a variety of needs.

Successful implementation of new educational programs requires teacher empowerment. Psychological empowerment has "cognitive, motivational, informational, and behavioral components" claims Cary Cherniss (1997, p.138), a researcher in applied psychology. Chernis (1997) found that educators were more likely to support programs they had a role in creating. The essential first steps in creating effective classroom strategies are to help educators understand and interact with the concepts of sensory processing. Once there is an understanding of processing differences, groundwork can be laid to collaboratively design strategies that will help address the diverse learning needs of children in general education classrooms.

It is important for teachers to become informed about sensory processing and sensory strategies in order to create more inclusive, successful environments for children with a range of sensory processing needs (Sparker & Sparks-Keeney, 2011). Sharing knowledge from the discipline of occupational therapy may prepare and empower educators to establish and implement school-wide sensory strategies and enhance learning for all students.

Addressing the Adult Learner

Educating adults through professional development is different than educating children, "adults' need to engage in learning that has a clear and direct job application," (Bellanca, 1995). It is important to create a presentation for adult learners that will maximize the probability of the participants transferring presentation information into action. This requires that the presentation: has clear objectives that relate to training activities and relevance in the participant's job setting, appeals to the interests of the learners, actively involves the participants to share their experience and knowledge, and treats the participants as equals (Center For Disease Control, 2008). Engaging the adult learner also means providing opportunities for the learner to apply their knowledge (Knowles, 1970).

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Purpose statement

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In order to support teaching, learning, and student classroom participation corresponding with the Common Core Learning Standards, the purpose of this project was to present future educators with an in-service, to provide an overview of sensory processing and resources for implementation of sensory strategies within the classroom.

Procedures

Identifying Target Population

Pacific Lutheran University (PLU) has a reputable school of education, and expressed an interest in an introductory in-service on simple sensory strategies presented to the undergraduate education students. After speaking with individuals within the education community, it is clear there are discrepancies in knowledge about CCSS, RtI, IDEA 2004, and sensory processing issues. Learning more about these topics may assist future educators in meeting the needs of an ever-changing student body and provide awareness of tools to assist with accomplishing CCSS.

In-Service Preparation

Handouts, activities, and a pre- and post-surveys (see Appendix A) were designed for the in-service based on conversations with Mary Sue Williams and Sherry Shellenberger, founders of the Alert Program®. Williams and Shellenberger provided permission to use their image, content, and specific handouts. The Alert Program® was selected as the focus of the presentation because it offers a comprehensive and easy to understand and implement program that provides an overview of a range of sensory strategies that are free or low-cost. The presentation was deliberately focus on one specific program to provide a solid understanding of sensory strategies as opposed to offering a broad overview of many programs, which could have been confusing for education students learning about sensory strategies for the first time. Research was conducted on the best ways to engage the adult/professional learner to assist in the design and implementation of the presentation. Materials were gathered to provide physical examples of dynamic seating options, classroom design ideas, and interactive sensory strategies.

In-Service Content

A 90-minute in-service was designed and presented to the students at the PLU school of education. A descriptive background overview of sensory processing was provided and the importance and effectiveness of simple sensory strategies in meeting the needs of classroom students was presented. Considerations for the adult learner were made during the design of the in-service, including kinesthetic, visual, and auditory learning opportunities (Russell, 2006) to support the potential needs of the participants.

The content of in-service addressed the CCSS for learning and how sensory strategies may be effective in helping educators and students meet these standards. The in-service briefly reviewed IDEA 2004 and RtI to discuss current educational policies and protocols that are in place to assist children with disabilities. The range of abilities and differences that may be present within the general education classroom was discussed. The tiers of intervention/systematic support that can be provided by the school occupational therapist, the teacher, and the school was explained. The focus of the material was tied to the goal of increasing focused seated-learning time to assist students' success with the CCSS for learning.

Sensory systems and sensory processing issues were addressed, and statistics of the frequency and co-morbidities that sensory processing issues have with other disorders were presented. The school of education students were presented with simple sensory strategy examples that can be used in the classroom. The simple sensory strategy examples represented the continuum of strategies that are available to emphasize that there is no one solution, but a variety of solutions/supports that can work within the unique culture of each classroom. Options for strategies varied in price, subject matter, timing for the strategies, and style. A discussion followed welcoming feedback on the attendees' response to the strategies. Some of the

approaches addressed included The Alert Program's® language to discuss students' personal

engines, ideas for movement breaks, fidget tools, and various other simple sensory strategies.

Resources and troubleshooting were discussed when considering the ease of implementation of

different strategies. Brainstorming discussions took place to enable future educators to consider

potential challenges for implementation.

Throughout the in-service future educators at PLU were provided with lecture materials

explaining the relevance of how sensory processing and sensory strategies relates to their future

roles as classroom educators. They were also provided with opportunities for brainstorming

strategies they each use to regulate their sensory system. By providing pre- and post-survey's to

the future educators, the participants were able to identify their starting level of understanding,

and then later self-assess their level of comprehension following the in-service. PowerPoint

slides appealed to visual learners, verbal materials appealed to auditory learners, and movement

breaks provided practice examples of sensory strategies for kinesthetic learners. Engaging all

learning styles facilitated connection with the spectrum of learning styles within the group of

future educators at PLU (Russell, 2006).

Materials

Several materials were created and used for the in-service. PowerPoint slides were

designed to present the information, along with prepared verbal dialogue for the presentation.

Sensory strategies were incorporated periodically into the presentation to demonstrate the

effectiveness of movement breaks, including isometric exercises, a sing-along song with easy to

follow movements, and an introduction and explanation of simple hand fidgets provided to

participants (straws, rubber bands, pipe cleaners, and paper clips). In-service attendees were

provided with information about possible resources to assist with implementation, including an

Introductory Booklet on the Alert Program®, a handout explaining the relevance of RtI (provided

by the Alert Program®), and a handout on Changing How Alert You Feel (provided by the Alert

Program®). A CD was created to remain at the University of Puget Sound to assist future

occupational therapy students in preparation for an in-service of similar content for future

educators. The CD contains the PowerPoint slides used for the presentation, verbiage for

presentation delivery included in the notes section of the PowerPoint slides, a time method

content outline of the presentation timing, essential content, and speaker allocation, information

on finding and creating relevant handouts, and an introduction to the CD explaining the

permissions obtained from the Alert Program® to use their image, content, and products for the

in-service.

Pilot In-Service

To pilot the in-service, 60 first and second year occupational therapy students at the

University of Puget Sound (UPS) were invited to participate in a pilot in-service, 11 of the 60

attended. They were encouraged to provide feedback on the design, content, and implementation

of the in-service. The pilot was held during a 60-minute "brown bag lunch" presentation session

at UPS. Revisions were made based on participant feedback; including, elimination of a question

on the pre-survey asking about the participant's anticipation about sitting for 90 minutes. Based

on the feedback, images and explanations were added and definitions of the proprioceptive

system and the vestibular system were simplified. The background theme of the PowerPoint

slides was revised. Materials were finalized and replicated for distribution for the in-service,

including a handbook, handouts provided by the Alert Program®, various low cost sensory

strategies, and revised copies of the pre and post surveys.

Skills and Knowledge Needed for the Project

The in-service design was influenced by research regarding sensory strategies, education legislation, teacher collaboration, and adult education. Investigation into effective communication and presentation formats aided in preparation for an in-service style of delivery targeted towards adult learners. Faculty at UPS provided useful resources, which shaped the format and style of the presentation. Knowledge of sensory processing, legislation related to education (IDEA 2004, RtI), and changes to the Common Core Learning Standards further strengthened the focus of the presentation. Investigation into school and classroom structures, routines and strategies that have previously been incorporated, and strategies for learning that have been successful or failed were important considerations. The in-service content was designed based on research on the challenges faced by teachers, resources available to teachers, and how teacher's access resources. The Ecology of Human Performance (EHP) model (Dunn, Brown, & McGuigan, 1994) strengthened the project's connection with the foundations of occupational therapy.

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Overview

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PLU prepares elementary school educators to become inspiring, nurturing innovators within the teaching community. Their mission is "to empower students for lives of thoughtful inquiry, leadership, service, and care --- for others, their communities, and the Earth" (Pacific Lutheran University, 2013). The discipline of occupational therapy can collaborate with future educators to increase awareness and problem-solve for challenges they may encounter in general education classrooms. With changes in the structure of the academic day (decreased access to recess, physical education, art, and music) and an emphasis on CCSS assessment (Graham et al., 2002), children have fewer opportunities for sensory stimulation and increased pressure to

sustain attention during longer seated-learning periods. It is important that future educators be informed on sensory processing needs of children, and develop an awareness of resources and strategies they can incorporate into the classroom to assist students with regulating their energetic needs throughout the day. An understanding of these principles may assist teachers in structuring lesson plans and activities for a broad range of children with sensory needs (Murray, Baker, Murray-Slutsky, & Paris, 2009).

The target population for the in-service was the PLU school of education students. Forty-five out of the fifty second year undergraduate students attended the in-service as part of a mandatory class. The PLU school of education strives to continue to innovate and create ways to uncover and nurture student potential (Pacific Lutheran University, 2013). This in-service provided a new, creative solution for educators to support children with sensory processing differences.

After attending the in-service, future elementary school educators may have a better understanding of the importance of and the variety of simple sensory strategies. All surveys indicated participants may have increased their understanding and familiarity of IDEA 2004, RtI, and sensory processing. Based on the results of our pre- and post-survey given to the in-service participants, on the pre-survey 41.8 % of the respondents rated their understanding of IDEA 2004 at a 4 or 5 out of 5 (1 meaning no knowledge, 5 meaning completely understand), while 76. 7 % gave the same rating (4 or 5 out of 5) on the post-survey. Ratings of understanding of RtI increased: 34.8 % selected 4 out of 5 on the pre-survey, while, 81.3 % of the respondents selected a 4 or 5 out of 5 on the post-survey. When asked to rate their level of understanding/familiarity of sensory processing, 79.1 % of respondents responded with a 2 or 3 on the pre-survey; while, on the post-survey 74.4 % of respondents selected a 4 or 5.

On the pre-survey, 60.4 % of in-service participants had been uncertain or did not believe they had sensory preferences; whereas, on the post-survey, 97.6 % of in-service participants indicated they have unique sensory preferences. Seventy-one percent of the 45 students reported that they will "absolutely" incorporate sensory strategies into their classroom routines and 22 % of the students reported they will "likely" incorporate the sensory strategies. Based on this data, it appears the in-service was effective in conveying the simple message that we all have sensory preferences and some students will need sensory strategies to effectively calm or alert themselves throughout the day for successful focused learning. At the conclusion of the in-service, eight students remained to discuss the incorporation of sensory strategies into the classroom and to request additional resources and locations to purchase sensory tools. Specific classroom situations and individual student's behaviors were discussed and considered from a sensory processing frame of reference.

The in-service is a step towards establishing a lasting relationship between the department of occupational therapy at UPS and the school of education at PLU. This in-service could prove to be the first of an annual exchange between the two departments. Overall, the in-service was designed to create informed and resourceful advocates for sensory strategies within the general education community. A CD has been created containing this thesis paper, the Powerpoint slides, the handouts, and useful references for occupational therapy students to easily replicate a similar presentation for educators in the future.

Outcomes

Goal 1

After attending the in-service, future elementary school teachers from the Pacific Lutheran University school of education will identify sensory strategies they can utilize to increase student attention and participation during focused learning.

Objective 1. After attending the in-service, future elementary school teachers will be able to independently identify three simple sensory strategies they would be interested in utilizing which would match with their individual teaching styles.

Objective 2. After attending the in-service, future elementary school teachers will be able to explain legislations, which could support implementation of sensory strategies for students with disabilities.

Objective 3. After attending the in-service, future elementary school educators will be able to define sensory processing disorder.

This goal and corresponding objectives were measured by a post-survey which were distributed and completed at the time of the in-service. This goal and corresponding objectives was met on March 20, 2014 based on student response in the post-survey following the in-service.

Goal 2

As a result of attending the in-service, teachers will make available sensory strategies for students to independently select and manage their energetic needs throughout the day, which may lead to increased focused learning time.

Objective 1. As a result of the use of classroom sensory strategies, students will cause fewer behavior disruptions that require the attention of the teacher.

Objective 2. As a result of the use of classroom sensory strategies, students will independently use sensory language and concepts to describe their energetic needs.

This goal and corresponding objectives will be assessed through completion of a short survey given to in-service attendees at the end of their first year of teaching in their own classroom (see Appendix C for a sample survey). On a post-survey following the in-service 71 % of the 45 students reported they will "absolutely" incorporate sensory strategies into their classroom routines and 22 % of the students reported they will "likely" incorporate the sensory strategies.

Goal 3

As a result of the collaboration between the department of occupational therapy at UPS and the school of education at PLU, a long term relationship between disciplines will be forged, facilitating the creation of resourceful advocates for sensory strategies within elementary education.

Objective 1. As a result of the collaboration between the school of education and the school of occupational therapy, teachers from the PLU school of education will be able to identify one way to collaborate with an occupational therapist to incorporate sensory strategies into their classroom.

This goal and corresponding objective can be assessed by the UPS school of occupational therapy through self-report of the number of in-service exchanges between UPS and PLU, and the frequency of reported future collaborations for participants (see Appendix D for a sample self-report assessment). Since the presentation of this in-service, UPS and PLU have not engaged in any academic exchanges of information, therefore, goal three and its objectives were not met at the time of publication. To support the future exchange between UPS and PLU, a CD has been

created containing this thesis paper, the PowerPoint slides, the handouts, and useful references

for future occupational therapy students to easily replicate a similar presentation for future

educators in an academic setting.

Implications for Occupational Therapy

The environment shapes a person's participation in a task. The interaction between a

person, a task, and the surrounding environment is of underlying importance within ecological

frames of reference. The Ecology of Human Performance (EHP) is an ecological model designed

with language to aid interdisciplinary collaboration (Dunn, Brown, & McGuigan, 1994). In the

past, the role of the occupational therapist within the education system has been to provide

individualized, one-on-one, pull-out sessions for students who are eligible for services under the

special education model. With the implementation of RtI, there are increasing opportunities for

occupational therapists to collaborate and develop intervention strategies on many levels to

support student learning (Swinth, 2013). Assisting an individual now requires focusing on the

larger systemic picture within the culture of the students' classrooms in order to support student

participation and performance (Swinth, 2013). In every environment, the person and contextual

factors together shape the task. A person's competencies to complete tasks are influenced by

environmental supports and/or barriers. An occupational therapist, utilizing this frame of

reference looks to establish supports and remove barriers, to create the greatest fit for the person

within a specific context. In doing so, the therapist is helping to widen the client's 'performance

range' (the scope of things that person is able to successfully accomplish) (Dunn et al., 1994).

The EHP identifies five intervention strategies that provide a useful framework when

considering how to approach options for increasing performance range: establish/ restore

adapt/modify, alter, prevent, and create (Dunn et al., 1994). These strategies helped to frame the

approach for this project. This project aimed to present information and a variety of approaches educators could utilize when attempting to improve the educational environment and promote learning in their classroom. By providing an overview of the IDEA 2004, the RtI model, and concepts of sensory processing differences, educators may better understand their roles and be prepared to utilize the supports in place to advocate for classroom and school-wide adaptations. These understandings can serve as the foundation inspiring the adaptation of classroom environments, establishment of new classroom routines, and/or establishment of verbiage students can use to express and explore their energetic needs. If the environment is restructured to support a continuum of needs, it is more likely the general education classroom will be a good fit for a greater diversity of students.

This project's intent was to improve the areas of occupation for teachers' job performance and students' education participation. In doing so, educational participation, social participation, and play participation of the children within the classroom may benefit (AOTA, 2008). Teachers within the general education classroom are expected to perform many concurrent and sometimes conflicting tasks. Classrooms are becoming more complex with children with varying physical, cognitive, sensory and temporal needs (Sparker & Sparks-Keeney, 2011). Expectations for success in statewide standardized assessments are increasing (Whitten et al., 2009). There are greater limitations in teachers' abilities to design and shift the routines of the day. This project aimed to provide educators with resources to help them understand the sensory needs of the diverse population of students they serve and how partnering with their school occupational therapist they can work to create a classroom and lesson plans to meet the needs of these diverse learners. The goal was to provide a variety of solutions that can

be integrated within the culture of individual classrooms in order to support student participation

and performance (Swinth, 2013).

      The temporal and physical routines of a classroom significantly influence the activity

demands required of the students, including required body functions, required body structures,

required actions and performance skills, sequencing and timing, social demands, space demands,

and objects and their properties (AOTA, 2008). Occupational therapists can help to develop an

understanding of these routines utilizing a sensory framework, thus educators may prevent

barriers to learning and establish new supports to create the greatest fit for learning for all

children. Creating a restful space within the room, or modifying how a day is structured by

incorporating movement could help students create new advantageous routines and roles.

Altering students' understanding of what their bodies need, preventing inattention by engaging

the senses and creating a time for unstructured play are solutions for change (Sparker & Sparks-

Keeney, 2011).

      By exploring these options, educators may be altering the sequence and timing of when

children sit and for how long, which may influence their required body structures and functions

(AOTA, 2008). Teachers will be made aware of how introducing new objects can engage or

quiet the senses and promote focused learning. Teachers may learn how to create new spaces that

could allow students to rest and be more prepared to rise to the complicated social demands they

are presented with in their days. More students may be able to broaden their performance range

and successfully fill the all-important role of successful student. Collaborating with occupational

therapists, more educators may be able to increase their positive influence on each student's

learning and successfully navigate the demands of the Common Core State Standards.

Limitations and Considerations

Throughout the process of preparing for and carrying out the in-service for future educators at PLU, several limitations were identified, as well as considerations when looking back on the process and the product.

There are existing barriers and limitations which prevent students and faculty from supporting this type of collaboration between education and occupational therapy students. Concepts of sensory processing and sensory strategies are, for the most part, unfamiliar ideas to the teaching education curriculum. When proposing this collaboration with the UPS department of education, the department had believed this topic was more appropriate for "special" education classroom. The audience at PLU was receptive and engaged with the content of the in-service. The hope is that by providing an influential in-service and outlining solutions and innovations, future interest/dialogue will be sparked and prospective demand from PLU and/or other collegiate level education programs for similar collaborative in-services will be identified.

Another potential limitation is that teacher's implementation of the simple sensory strategies into the classroom rely on their individual motivation and their ability to apply what they have learned to a functional context. Teachers have many requirements and standards to meet, and multiple daily tasks to complete in addition to their role as teacher. Adding to the educators' workload was an important consideration and not the intent of this project. Simple, and often free or low cost, strategies to make educators jobs easier are available. The in-service was designed to provide accessible resources that will allow teachers to focus more on their job of education and less on the behavioral challenges of their students.

Education is constantly evolving with new legislation and mandates. In creating a beneficial resource for future educators, it was important to consider the current educational

climate, applicable legislation, standards, state and national mandates for teachers and school

districts, school and classroom operation procedures, classroom structure and routine, and how

educators access and incorporate new knowledge and resources into their current practices. It

was important to address the adult audience with comprehensive, yet accessible language

regarding current laws and mandates, and the evidence-based research behind sensory strategies

in an engaging format. Knowledge of sensory processing, and the neuroanatomy involved is

necessary to understand strategies to help the physical, neurological, and emotional processes

required in successful learning. Understanding how to best prepare and present information to

the adult learner was essential in designing presentation content.

Recommendations for the Future/Sustainability

Based on the results of this project, it is recommended that continued educational

exchanges between PLU and UPS occur. A CD has been created to remain at UPS to assist

future occupational therapy students in preparation for an in-service of similar content for future

educators. The CD contains the PowerPoint slides used for the presentation, verbiage for

presentation delivery included in the notes section of the PowerPoint slides, a time method

content outline of the presentation timing, essential content, and speaker allocation, information

on finding and creating relevant handouts, and an introduction to the CD explaining the

permissions obtained from the Alert Program® to use their image, content, and products for the

in-service. The product is in place for future students to carry out the in-service. Providing more

students in the school of education at PLU with knowledge about sensory processing, and simple

sensory strategies could be the next step. The audience could also be expanded to include

students in physical education, special education, music education, and additional classes in the

general school of education. In addition, providing an in-service to other future educators at other

universities, including potentially, the school of education at UPS, may allow for increased

departmental exchange within the university. This may support the beginning of a professional

interaction between future occupational therapists and future educators who may eventually

work alongside one another, promoting cross discipline collaboration. This may also allow future

professionals to start sharing knowledge early on to promote effective communication between

the two disciplines.

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Appendix A

Simple Sensory Strategies Pre Survey

This survey provides us an opportunity to understand the effectiveness of our presentation. We appreciate your input! At the bottom of the survey is a place to put a secret word or symbol that will be used to match your pre and post surveys. Please use the same word/symbol on both the pre and post surveys.

Age:_____

Year in School: _____

Anticipated Degree:_____

For questions 1-3 please rate your understanding/familiarity:

	No Knowledge				Completely Understand
1. How would you rate your understanding/familiarity of IDEA 2004?	1	2	3	4	5
2. How would you rate your understanding/familiarity of RTI?	1	2	3	4	5
3. How would you rate your understanding/familiarity of sensory processing?	1	2	3	4	5

4. What percentage of a typical classroom includes kids with sensory processing issues?
A. 0%   B. 15%   C. 60%   D. 90%

5. Do you personally have sensory preferences?
A. Yes   B. No   C. I don't know

For question 6 please rate anticipation of sensory processing as a problem in your classroom.

	Not a problem				Absolutely a problem
6. Do you think sensory processing will be a problem in your classroom?	1	2	3	4	5

7. Name senses you rely on to keep yourself alert throughout the day? (circle all that apply)
A. Mouth   B. Move   C. Touch   D. Listen   E. I don't know   F. None

Code word/symbol:_____

Simple Sensory Strategies Post Survey

This survey provides an opportunity for us to understand the effectiveness of our presentation. Please be honest. We appreciate your input! At the bottom of the survey is a place to put a secret word or symbol that we will use to match your pre and post surveys. Please use the same word/symbol on both the pre and post surveys.

For questions 1-3 please rate your understanding/familiarity:

	No Knowledge				Completely understand
1. How would you rate your understanding/familiarity of IDEA 2004?	1	2	3	4	5
2. How would you rate your understanding/familiarity of RTI?	1	2	3	4	5
3. How would you rate your understanding/familiarity of sensory processing?	1	2	3	4	5

4. What percentage of a typical classroom includes kids with sensory processing issues?
A. 0%   B. 15%   C. 60%   D. 90%

5. Do you personally have sensory preferences?
A. Yes   B. No   C. I don't know

7. What sensory system(s) do you rely on to keep yourself alert throughout the day?
_____

For question 8 please rate your level of preparedness.

	Not prepared				Completely prepared
8. How prepared are you to face sensory processing challenges in your own classroom?	1	2	3	4	5

9. What are sensory strategies do you anticipate implementing in your future classroom?
_____

For question 10 please rate the likelihood that you will implement sensory strategies in your future classroom.

	Never				Absolutely
10. How likely are you to implement the strategies	1	2	3	4	5

Code word/Symbol:_____
**Please include any additional comments or feedback on the reverse side of this form. Thank you.

Appendix B

Examples of Sensory Strategies

1. Look (visual input)

- Tent or reading corner to allow a place to block out visual distractions
- Seating arrangements: placing students that are distracted visually at the front of the room, so there are fewer visual distractions to block out
- Lighting: Increase the amount of light in a room (natural or artificial) is alerting, while using softer, dimmer lighting is more calming.
- Visual distractions: limit the amount of papers and art work hung on walls or hanging from the ceiling in a classroom
- Read a book or look at a magazine
- Watch fish in an aquarium

2. Mouth

- Water bottles - sucking is alerting
- Chew crunchy food, such as carrots, pretzels, or nuts
- Eat sour food, such as sour candy or pickles
- Eat chewy food, such as gum, cheese, or bagels
- Drink from a straw
- Take slow deep breaths
- Blowing bubbles
- Taking a harmonica or kazoo break

3. Listen

- Listen to classical music, even beats are calming
- Listen to hard rock music, loud bass and uneven beats are alerting
- Use headphones or earplugs to block out auditory distractions
- Turning off buzzing overhead lights
- Using a louder voice to energize, lower/softer voice to calm
- Designating a quiet area

4. Touch

- Hold or fidget with paper clips, putty, rubber bands, straw, jewelry, clay
- Give yourself a hug
- Rub your skin or clothing
- Take a cold shower or a warm bath
- Pet or play with an animal
- Use a lap pad filled with rice, beans, or lentils on your lap
- Hold a stuffed animal or pillow
- Gluing pieces of carpet and other texture on a piece of cardboard and fastening the cardboard to the bottom of a desk, so students can fidget without visually distracting others

5. Move
- Isometric movements: pulling hands apart, pushing hands together, pushing yourself up on a chair, pulling yourself down into your chair, pushing against a desk or wall)
- Walk quickly
- Shake head quickly
- Roll neck slowly in circular motions
- Jump up and down
- Sit on a therapy ball, a partially inflated camping cushion, or a partially inflated beach ball
- Play sports
- Yoga
- Dance
(Williams & Shellenberger, 1994)

Appendix C

Sample of Survey Questions to Measure Goal Two and Corresponding Objectives One and Two

The following questions are available to give to in-service attendees following their first year of teaching in their own classroom.

1. Did you make sensory strategies available to students in your classroom?
2. Have you noticed a change in students behavior when cued to use the sensory strategies?
3. Did you introduce verbiage for students to use to identify their state of alertness?
4. Have students been able to use sensory language to describe their energetic needs?

Appendix D

Sample of Self Report Questions for the University of Puget Sound Occupational Therapy Department to Measure Goal Three and Corresponding Objective One

The following questions are available for the University of Puget Sound occupational therapy department as part of a self-report of future exchanges between UPS and PLU.

Was this in-service, or a similar in-service presented to PLU school of education students following the spring of 2014? Yes or No

If no, what were the barriers preventing the presentation of the in-service on simple sensory strategies?

Could in-service participants identify how they would collaborate with occupational therapists in their professional settings to incorporate sensory strategies into their classroom following an in-service? Yes or No

If no, what were the barriers education students had for collaborating with occupational therapists?