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Understanding visual perception in school-aged children and its impact on occupational performance

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BOSTON UNIVERSITY
SARGENT COLLEGE OF HEALTH AND REHABILITATION SCIENCES

Doctoral Project

**UNDERSTANDING VISUAL PERCEPTION IN SCHOOL-AGED CHILDREN
AND ITS IMPACT ON OCCUPATIONAL PERFORMANCE**

by

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DEDICATION

I would like to dedicate this work to my parents, William and Patricia Markley. In memory of my father who always instilled hard work and encouraged lifelong learning.

To my mother, who proved that it was possible to go back to school while raising a family and encouraged me every step on this journey. I would also like to dedicate this work to my husband Scott and my son Noah. To my husband Scott, without your constant love and support this work would not be possible. To my son Noah: may you always stay true to yourself and continue to work hard. I am so incredibly proud to be your Mom.

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ABSTRACT

Children with deficits in visual perception can present with impairments that impact their independence as a student in the classroom. As part of an occupational therapy evaluation in a school-based setting, standardized assessments are used to evaluate a child's visual perceptual skills. A comprehensive literature search showed that standardized assessments alone do not show a functional presentation of a child's whole performance, and additional measures are needed to connect impairments of visual processing with function (Brown et al., 2011; Howe et al., 2017; Schmetz et al., 2018; Sullivan et al., 2018).

Having a comprehensive understanding of a child's functional skills in visual perception will assist the occupational therapy practitioner in supporting them to be a full participant within the classroom. *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance* is a training program designed to educate the occupational therapy practitioner on providing a comprehensive assessment of visual perceptual skills with children in a school-based setting. This program is grounded in practice theories, informed by the current literature, and has a program evaluation plan. The theories that guide this program include Person Environment

Occupation Model (Law et al., 1996), and Adult Learning Theory (Knowles et al., 2015).

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LIST OF ABBREVIATIONS

ACOTE	Accreditation Council for Occupational Therapy Education
AOTA	American Occupational Therapy Association
BEERY	The Beery-Butenika Developmental Test of Visual MotorIntegration with subtests in Visual Perception and Motor Coordination
DTVP-3	Developmental Test of Visual Perception-Third Edition
ECSE	Early Child Special Education
FAPE	Free and Appropriate Public Education
MVPT	Motor Free Visual Perception Test
TTL	Team Teaching and Learning Framework
TTT	Table Tennis Training
TVPS-3	Test of Visual Perceptual Skills – Third Edition
VP	Visual Perception
WFOT	World Federation of Occupational Therapists

CHAPTER ONE

Introduction

Elementary school-aged children that have impairments in visual perception can present with weaknesses impacting their occupational performance as a student in the classroom. This can result with them having difficulty keeping up with the demands of work in the classroom.

The World Federation of Occupational Therapists states “In occupational therapy, occupations refer to the everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. Occupations include things people need to, want to, and are expected to do” (World Federation of Occupational Therapists, 2012, para. 2). In our role as a school-based occupational therapist, we are a part of an interdisciplinary team working to assist children to be full participants in their occupation as a student.

When referring to the *Occupational Therapy Practice Framework: Domain and Process*, fourth edition (American Occupational Therapy Association, 2020), impairments in visual perception can impact areas across all occupations. This can impact a student’s ability to perform activities of daily living, instrumental activities of daily living, education, play, and leisure. Under client factors, it can impact memory, perception, sensory functions (visual, proprioceptive) and movement functions. Under performance skills, it may impact motor and process skills. Under performance patterns, it can impact their habits, roles, and rituals as an individual person or in a group. When considering context and environment, it is important to be mindful of their culture and

environment when considering the overall impact on their occupational performance.

When a child is presenting with impairments that are impacting their performance in the classroom, the occupational therapist is often called to evaluate the student and identify what is causing their impairment as well as provide a treatment plan and strategies for the child in the classroom. This author had found in her practice within a school-based setting that the results of the visual perception standardized testing did not always provide a clear picture as to why the student was struggling functionally within the classroom. When conducting research on this topic, Brown et al. (2009); Brown et al. (2011); Richmond and Holland (2011); and Sullivan et al. (2018) concluded that there is a deficit with the correlation of standardized testing and assessment of functional skills, and additional measures need to be utilized in order to provide an overall comprehensive assessment. Currently, there is no tool available that provides a comprehensive assessment of visual perceptual skills for students in a school-based setting. As a result, there needs to be more training given to school-based occupational therapy practitioners to address this deficit area.

This author is proposing a training program for occupational therapy practitioners that addresses the above stated problem that is titled, *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance*. This is a training program that was developed to educate occupational therapy practitioners on how to bridge the gap in the literature that states that standardized assessments in visual perception are to be utilized in conjunction with other measures to obtain an overall presentation of the child's visual perceptual skills in the classroom. In addition to the

most recent evidenced-based research, this program development is guided by the Person, Environment, Occupation Model (Law et al., 1996), as well as the principles of Adult Learning Theory (Knowles et al., 2015). The Person, Environment, Occupation Model would guide this program as evidenced by being mindful on the ultimate goal of having the child participate in meaningful and purposeful activities while addressing their visual perceptual needs in the classroom. The principles of Adult Learning Theory would be utilized to engage the adult learner (participants) as well to value their prior experiences to make the training meaningful and to generalize skills learned immediately in practice (Knowles et al., 2015). This training program would be proposed to school-districts as a half-day training in person program to be provided to the occupational therapy practitioners during their professional development time allotted by the school district. Additionally, this would be marketed to be paid for by the school district so there would be no out of pocket expenses by the individual occupational therapy practitioner.

When understanding how visual perception can impact a student's overall functioning on occupational performance, this training module that is being proposed is two-fold. One part is a training module for the occupational therapy practitioner to be able to have the education to provide a comprehensive assessment of a child's overall visual perceptual skills, but also to have the resources for strategies to use with the child to allow them to be a full participant within the classroom. The other part of the training module is for the classroom teacher to be able to carryover strategies and accommodations within the classroom throughout the child's school day.

The goal of this program is to provide the school-based occupational therapy

practitioner the most recent evidenced-based research on providing a comprehensive assessment, practical application, and skilled intervention of visual perceptual skills within the school-based setting. Upon conclusion of the training, the occupational therapy practitioner will be able to implement these newly learned skills immediately in practice. This would also include providing education to the classroom teacher on strategies and accommodations to assist the child to be a full participant within the classroom.

CHAPTER TWO

Theoretical and Evidence Base

This doctoral project's mission is to provide education to the school-based occupational therapy practitioner to increase their knowledge base on providing comprehensive assessment methods for the evaluation and treatment of visual perceptual skills with children in the school-based setting. It is important for the school-based occupational therapy practitioner to have knowledge on how these impairments impact a child functionally within the classroom, and to be able to identify what is needed for them to be able to maximize their occupational performance.

The Problem

Elementary school aged children that have impairments in visual perception can present with weaknesses impacting their occupational performance as a student in the classroom, as well as in all aspects of their life. A child's main occupation is being a student and attending school, so this will be the focus of this project (American Occupational Therapy Association, 2020). These deficits in visual perception can result with these students having difficulty keeping up with the demands of the expected work completion. This impacts their ability to be a full participant in their classroom.

The occupational therapist is often asked to evaluate students with impairments and come up with a treatment plan and/or strategies to assist the student in the education setting. The occupational therapist has training in visual perception, but it is not always known if the child has any other co-occurring factors that impact their functional performance. By not having all of the details as to why a particular student is struggling,

can result in difficulty identifying the root cause and address appropriately in a school based setting. In addition, the results of standardized assessments of visual perception do not always correlate to the functional presentation of the child within the classroom. The classroom teachers have limited resources and tools to assist the child throughout their school day to be successful and often seek out the support of the occupational therapist. The explanatory model below provides a visual description of the problem:

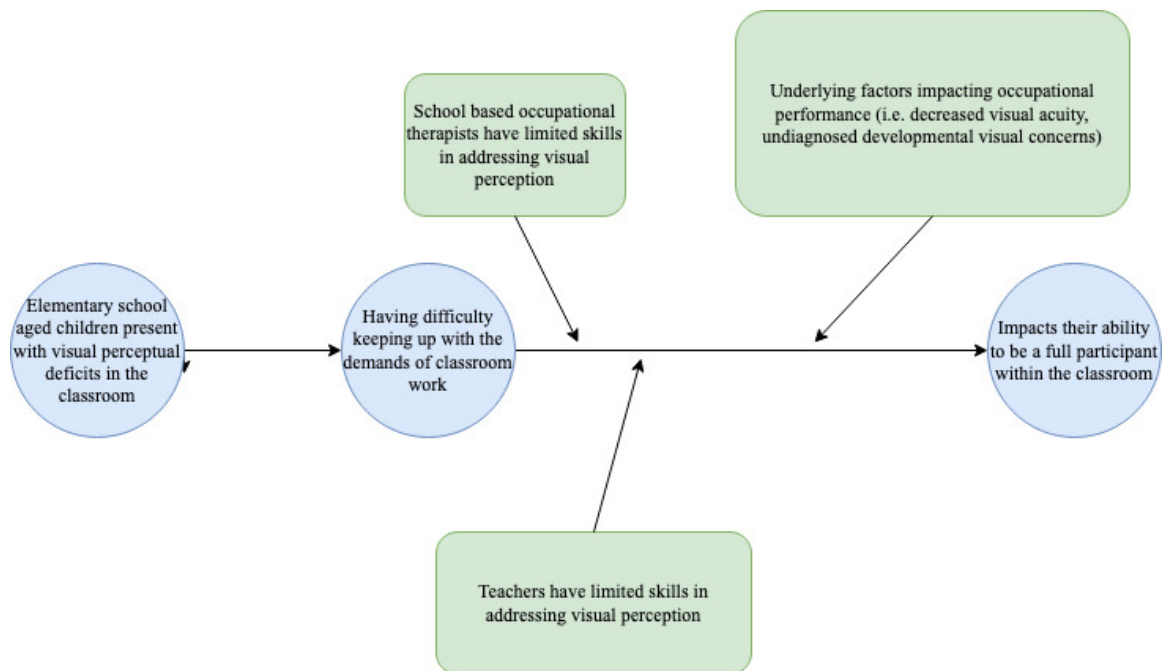


Figure 2.1 Explanatory Model

Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance seeks to address these challenges through a training program.

Theories Supporting the Program

There are two theories that support the training program *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance*- The Person Environment Occupation Model (Law et al., 1996) and Adult Learning Theory (Knowles et al., 2015).

The Person Environment Occupation Model looks at how the person responds within their environment and while performing occupations (Law, et al., 1996). This theory encourages a collaborative therapist and client relationship, and encourages the client to be successful in meaningful occupations in a motivating environment (Strong et al., 1999). This training module could describe the “person” as the child. The “environment” could describe the classroom that the child spends their school day in, and the “occupation” describes the child’s role as a student within the classroom. Law et al. (1996) defines occupational performance as “the dynamic experience of a person engaged in purposeful activities and tasks within an environment” (p. 16). The training module would also be guided by making sure the student is participating in meaningful and purposeful activities within the classroom while having the visual perceptual needs addressed.

The other theoretical framework that is being considered for this project is the Adult Learning Theory which can address the adult occupational therapy practitioner’s as learners (adult learners) as they are educated on the training program. Knowles et al. (2015) state six principles that addresses the adult learner, “learners need to know, self-concept of the learner, prior experience of the learner, readiness to learn, orientation to

learning, motivation to learn” (p. 6). These principles would be intertwined into the program. An explanation can be given on what visual perception is, what the rationale of the training program is, and how the strategies could be implemented with ease in the classroom. There would be some independence given within the program to allow the strategies to be integrated as the adult learner can fit it into the culture of the classroom, which could address the self-directedness of the adult learner. The background education and prior experience of the adult learner would be considered as the program is being developed and tailored based on past experiences of the participants. The program would address the readiness of the adult learner and address their willingness to participate as presented with evidenced based research.

The purpose of this inquiry is to determine if school-based occupational therapists have the skills necessary to address visual perception, and if standardized testing is sensitive to understanding occupational performance limitations in the classroom. This author conducted a comprehensive literature review across multiple databases guided by following research questions:

1. Is there evidence that school-based occupational therapists and teachers have limited skills in addressing visual perception?
2. Is there evidence that shows occupational performance deficits in the classroom from standardized visual perceptual testing?
3. Is there evidence on the impact of co-occurring factors that impact a student’s ability to be a full participant within the classroom?

Occupational Therapists and Teacher Skills in Addressing Visual Perception

The classroom teacher is often the first to identify if the child is having difficulties. They would need to have the knowledge base to refer the child to be assessed further. There were two articles that were found relevant to this research. Both articles were regarding training of teachers to identify vision and its impact on performance within the classroom. The results of these studies indicated that there is a lack of teacher training to prepare them to identify deficits of visual perception and the impact on the child's performance within the classroom (Andrick et al., 2015; McClain et al., 2008). There needs to be further education for the teachers to be able to have the skills to identify if the problems that the child is having in the classroom has a visual perceptual background, and for them to be able to seek assistance when needed.

In completing the research, there were gaps in the literature about the occupational therapists training with visual perception. This author then looked at *The Accreditation Council for Occupational Therapy Education (ACOTE) Standards and Interpretive Guide* (American Occupational Therapy Association, 2018). This guide details minimal skills and concepts that are necessary for entry level occupational therapists. The preamble states to "Be prepared to articulate and apply therapeutic use of occupations with persons, groups, and populations for the purpose of facilitating performance and participation in activities, occupations, and roles and situations in home, school, workplace, community, and other settings, as informed by the Occupational Therapy Practice Framework," and "Be able to plan and apply evidence-based occupational therapy interventions to address the physical, cognitive, functional

cognitive, psychosocial, sensory, and other aspects of performance in a variety of contexts and environments to support engagement in everyday life activities, that affect health, well-being, and quality of life, as informed by the Occupational Therapy Practice Framework.” Additionally under standard number B.4.3 it states, “Utilize clinical reasoning to facilitate occupation based interventions that address client factors. This must include interventions focused on promotion, compensation, adaptation, and prevention” (American Occupational Therapy Association, 2018, p. 28). The occupational therapy educational programs teach the underlying components as suggested by utilizing standardized testing and clinical reasoning skills to assist the child to achieve optimal independence within the classroom. It is understood that academic programs prepare the entry level therapist to have the general background knowledge in clinical reasoning skills, but it is unclear if training in understanding perceptual capacities in the context of the classroom is provided in all entry level programs. There needs to be further training to the school-based therapist to be able to identify how to do provide a comprehensive approach with the child specifically within the classroom.

Results of Testing and Links to Occupational Performance in the Classroom

It is important to be able to interpret the functional meaning of the results of standardized testing. Existing standardized tests measure seven areas of visual perception. These include visual discrimination, which is when an individual is able to identify the difference in objects from one another. Visual memory is when an individual can correctly identify an object after seeing it and have it taken away from the visual field. Spatial relationships is when an individual can identify when an object changes its

position and actually becomes a different object. Form constancy is when an individual can mentally move items into alternate positions while only using their vision, and to be able to recognize items regardless of changes in size, position, or shape. Sequential memory is when an individual can remember the exact same order of letters, objects, and pictures after being taken away. Visual figure ground is when an individual can find objects within a busy visual field. Visual closure is when an individual can successfully identify forms, letters, numbers, or objects even when a part of it is not able to be seen visually. (Andrich et al., 2015).

While it is important to have a measure of each area, it is also important to tie the measures to functional outcomes for the child in the classroom. Sullivan et al. (2018) found that *The Test of Visual Perceptual Skills-3* does measure the seven areas of visual perception, but it is inconclusive on the functional implications with the overall results. Brown and Rodger (2009) found that *The Test of Visual Perceptual Skills-Revised* assessed the seven areas of visual perception, but there were not any concrete functional results gained with the interpretation of the outcome measures. Three other studies concluded that therapists should utilize multiple methods of evaluations in order to have an extensive understanding of a child's overall visual perceptual motor abilities (Brown & Gaboury, 2006; Chiara Fastame et al., 2015; Howe et al., 2017). Williams et al. (2011) concluded that simple interventions can assist with visual perceptual difficulties, and more research is needed to be able to address these areas appropriately.

While administering and interpreting the results of standardized testing, the studies show that there appears to be a gap in the cumulative results of the seven areas of

visual perception and the functional implications for the individual that is being assessed (Brown & Gaboury, 2006; Brown & Rodger, 2009; Chiara Fastame et al., 2015; Sullivan et al., 2018).

Underlying Factors That Could Impact a Student in the Classroom

A classroom teacher may observe that a student will present with difficulties in the classroom, but may not always know the underlying factors as to why this is occurring. One study results indicated that visual perceptual deficits can be indicative of developmental dyslexia and dyspraxia (Cheng et al., 2018). Lambert and Spinath (2018) concluded that children with weak math skills showed impairments with visual spatial skills. de Waal et al., (2018); and Williams et al., (2011) found in their studies that visual perceptual deficits may be intertwined with cognitive impairments impacting academic achievement. They also concluded that executive functioning skills can also be linked to visual perception. Three studies showed the impact of visual perceptual deficits on handwriting skills, including difficulty with formation and speed, as well as with fine motor skills (Brown & Link, 2016; Prunty et al., 2016; Tseng & Chow, 2000).

Williams et al. (2011) discussed that when working with a child with visual perceptual deficits, one would need to take into account if there are other co-occurring factors in their past medical history that could be impacting their function.

Upon review of the studies, it is apparent that there is a lack of evidence in the training of classroom teachers to be able to identify when a child is presenting with visual perceptual deficits within the classroom. They need to have the knowledge base to identify and refer to the occupational therapist as appropriate. The occupational therapist

has skills in assessment, intervention, clinical reasoning and professional judgement. However, there needs to be a tool for the school-based therapist to use in conjunction with the standardized testing to achieve a comprehensive profile of the child in the classroom setting. In turn, this will allow the therapist to be able to identify the individualized strategies and accommodations to help the child achieve their optimal potential. Deficits in visual perception can present in a multitude of ways functionally within the classroom, and it is important to have the knowledge and training to identify and refer as appropriate to be able to receive the effective treatment. This will assist the child to be a full participant within the classroom.

The review of the existing evidence justifies the need for this doctoral project. The information that was obtained through the research supports that there is a gap in the literature in regard to providing a comprehensive assessment of visual perception for children in the school-based setting. The training program will bridge the gap and address the problem areas stated to allow for the occupational therapy practitioner to be able to identify the functional performance concerns and address within the school-based setting.

CHAPTER THREE

Overview of Current Approaches and Methods

Elementary school-aged children that have impairments in visual perception can present with weaknesses impacting occupational performance within the classroom.

There is a lack of evidence in the literature correlating the results of standardized assessments to the functional presentation of a child's visual perceptual skills within the classroom. There are also gaps in the literature in understanding the underlying factors impacting visual perceptual deficits in children.

The evidence was examined on how occupational therapists assess visual perception in a school-based setting, which interventions exist for treating deficits in visual perception with children, and what are best practices for teaching adult learners that will be providing these assessments and interventions.

When conducting research on this topic, this author conducted a comprehensive literature review across multiple databases in occupational therapy, neuropsychology, developmental optometry, and education guided by the following research questions:

1. Is there evidence of how occupational therapists assess visual perception of children in a school-based setting?
2. What visual perceptual interventions exist for achieving full participation with children in the classroom, and what is the evidence of their effectiveness?
3. What are best practices for teaching adult professional learners?

School-Based Occupational Therapy Assessment of Visual Perceptual Skills

There are a number of standardized assessments that occupational therapists use to assess a child's visual perceptual skills when completing an evaluation in a school-based setting. Some of the most commonly used assessments include *The Test of Visual Perceptual Skills- 4th Edition* (Martin, 2017), *Developmental Test of Visual Perception- Third Edition* (Hammill et al., 2014), *The Beery Butenika Developmental Test of Visual Motor Integration with Subtests in Visual Perception and Motor Coordination- Sixth Edition* (Beery et al., 2010), *Motor-Free Visual Perception Test- Fourth Edition* (Colarusso & Hammill, 2015) , and *The Computerized Perceptual Motor Skills Assessment* (Howe et al., 2017). When children are referred for an occupational therapy evaluation in a school-based setting, they are typically presenting with difficulties in the classroom as reported by their classroom teacher. The occupational therapist needs to have a comprehensive understanding of the visual system as well as the functional impact it has on visual perception (Sullivan et al, 2018). "It is imperative that the occupational therapists use the best assessment tools to obtain accurate and reliable results that lead to effective intervention, which will be noticeable in the classroom functioning of these learners" (Richmond & Holland, 2011, p. 33).

In reviewing the literature, standardized assessments "(DTVP, MVPT, and TVPS-3) evaluate visual perception on a two dimensional perspective and not on a three dimensional perspective" (Brown et al., 2011, p. 21). "There is no evaluation tool currently available to assess visual perceptual skills comprehensively" (Howe et al., 2017, p. 30). "Most batteries of tests are narrow in scope and provide a global score for

each process without contrasting the different presentation conditions and level of difficulties” (Schmetz et al., 2018, p. 320). There is a lack of evidence that correlates the functional presentation of a child within the classroom in conjunction with the results of the standardized assessments (Brown, et al., 2011; Howe et al., 2017; Richmond & Holland, 2010; Richmond & Holland, 2011; Schmetz et al., 2018; Sullivan et al., 2018). If the occupational therapist wants to have a comprehensive understanding of a child’s overall visual perceptual skills, they would need to utilize multiple assessment tools as well as non-standardized checklists to understand the functional impact that this child is experiencing within their occupational performance as a student within the classroom. (Brown et al., 2011; Howe et al., 2017; Richmond & Holland, 2011; Schmetz et al., 2018; Sullivan et al., 2018). Once the occupational therapist has the proper tools to be able to provide a comprehensive assessment of the child’s overall visual perceptual skills including standardized and non-standardized measures, this will then assist them to guide treatment and accommodations to allow the student to be successful within the classroom.

Evidence of Effective Visual Perceptual Interventions

The literature states that effective interventions can assist children to increase their overall functional visual perceptual skills (Alenzi, 2019; Chang & Yu, 2017; Chen et al., 2013; Chen et al., 2015; Howe, et al., 2013; Mehta & Nandgaonkar, 2019; Ramkumar & Gupta, 2016; Vlok et al., 2011; Wuang et al., 2018). Depending on the deficit area and functional impact identified in the evaluation of a child’s visual perceptual skills, there were several different interventions studied for the purpose of this

review. Visual perception interventions are divided into two major types: conventional activities (i.e. paper activities) and multimedia (Chen et al., 2013, Wuang, et al, 2018).

As part of multimedia interventions studied, “Game-Based Auxiliary Training Systems (GBATS) has been proven to be effective for treating visual perceptual dysfunction in children. Game-based interventions are effective in children not only because play is a natural activity, also because children have high neuroplasticity. Neuroplasticity has the potential to change brain structure” (Wuang et al., 2018, p. 28). Visual perceptual training programs focusing on multi-sensory strategies have been effective because the learners are connecting the sensorimotor experiences to the materials presented (Alenzi, 2019; Chen et al., 2013). Another study discussed the effectiveness of a table tennis training (TTT) program to improve deficits in visual perception. The authors rationalized that this program increased their neuroplasticity within the brain as evidenced by the numerous repetitions of the TTT and multisensory feedback that the individuals received while participating in the intervention (Chen et al., 2015).

When participating in interventions that focused on increasing visual perceptual skills through handwriting intervention, students that participated in a handwriting program showed improvements in handwriting speed, legibility, and their ability to copy from a far point surface (Chang & Yu, 2017; Howe et al., 2013; Mehta & Nandgaonkar, 2019). In one study, all of the participants showed improvements in handwriting as evidenced by a decrease in the use of the eraser, and also showed a decrease of errors in formation of letters and use of punctuation with writing tasks upon the conclusion of the

intervention program. In addition, the mothers of the study participants reported that they have seen an increase in their children's self-esteem and social interaction with others (Mehta & Nandgwonkar, 2019). Another study reported that the students that participated in the handwriting intervention program showed increased confidence when completing their work (Howe et al., 2013).

Another intervention that was proven effective in the literature was the use of an ocular motor program to assist individuals to increase their abilities to complete functional tasks. These results showed an increase in the child's overall skills math, reading, writing, work speed, and confidence (Vlok et al., 2011).

Best Practices for Teaching Adult Professional Learners

When reviewing the literature, it is important to understand what are the best practices for teaching adult professional learners. One professional development model studied was the "Team Teaching and Learning (TTL) Framework. This discusses five traits of teacher professional learning which include content knowledge, active learning, coherence, collective participant, and duration" (Smith et al., 2020). This study showed that when these traits were integrated into the training and the participants had an opportunity to practice newly learned skills with feedback, there appeared to be an increase in carryover of knowledge obtained and overall satisfaction. Another study's results also indicated that the facilitator "must find ways to ensure that the integration of new skills are implemented into practice through coaching, mentoring and follow up" (Tarnow et al., 2013, p. 396). Three other studies discussed how effective the professional development training was when the participants were provided research

based evidence on the information presented (Curran, 2014; Gromoske & Berger, 2017; Mahan & Stein, 2014; Trivette et al., 2012). It is also important to understand the effectiveness of blended learning environments to give the participants the opportunity to practice newly acquired skills (Vanslambrouck et al., 2018). There needs to be a meaningful connection to the new information presented and opportunities for the participants to practice newly acquired skills and for mentoring and feedback.

Providing a comprehensive assessment of visual perceptual skills is vital to obtain an overall understanding of a child's occupational performance deficits. Once those deficits are identified, an effective intervention program can be implemented to increase these overall skills. It is important that the individuals that are providing the assessment and intervention of visual perceptual skills have meaningful professional development trainings and opportunities for mentorship on proper implementation of the newly acquired skills. This will allow them to be able to provide the most recent evidence-based assessment and intervention of visual perception to be able to assist the child to be a full participant within the classroom.

Conclusion

The review of this existing evidence justifies the need for this doctoral project. The information that was obtained through the research supports the need for the occupational therapy practitioner to provide a functional assessment of visual perceptual skills in addition to administering standardized assessments with children in the school-based setting. This will allow the occupational therapy practitioner to have a comprehensive understanding of the child's presentation within the classroom. By having

this information, the occupational therapy practitioner can provide evidenced-based intervention on remediating and/or accommodating to the problem areas identified in the assessment. In addition, the literature also supports strategies for best practices for teaching adult learners which will be incorporated in this project.

CHAPTER FOUR

Description of Proposed Program

Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance is an educational training program for the school-based occupational therapy practitioner. The mission of this training program is to provide education to the school-based occupational therapist on comprehensive assessment methods for the evaluation and treatment of visual perceptual skills with children in the school-based setting.

Problems, Interventions, and Projected Outcomes

Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance aims to support the assessment and intervention of visual perception in school-aged children. “Occupational therapists need to be equipped to conduct a thorough assessment, so that they can link the child’s performance deficits to correct foundational factors” (Sullivan et al., 2018, p. 90). There is a lack of evidence in correlating the results of standardized assessments to the functional presentation of a child’s visual perceptual skills within the classroom. “There is no visual perceptual motor assessment currently available that measures all components of visual perception motor skills. Clinicians and educators often need to combine more than one assessment tool in order to obtain a comprehensive understanding of a child’s visual perceptual motor abilities” (Howe et al., 2017, p. 31). It is important for the school-based occupational therapy practitioner to have knowledge on how the impairments impact the students functionally within the classroom. In comparison of common standardized assessment

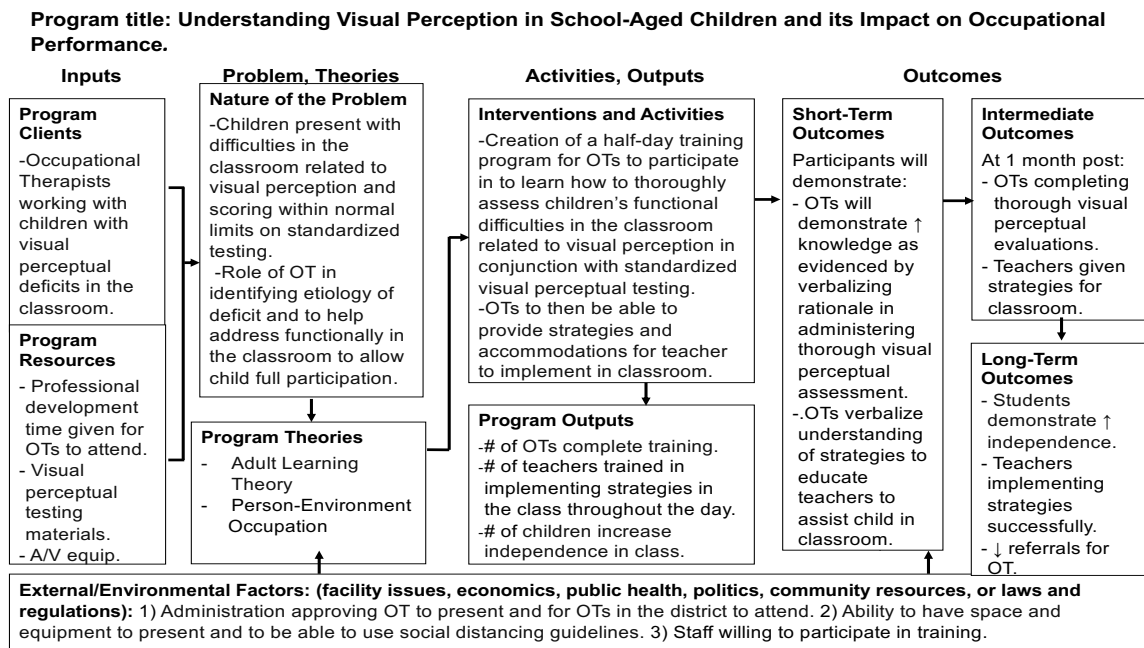
tools, the literature found that the results of the testing does not consistently demonstrate the overall functional presentation of the student's academic skills (Richmond & Holland, 2011). Sullivan et al. (2018) concluded that additional research is required to connect impairments with visual processing and function, and to have a comprehensive visual perceptual assessment to elicit and support occupation-centered practice.

There are gaps in the literature in regard to understanding the underlying factors impacting visual perceptual deficits. "Deficits in visual perception are observed in children with learning disabilities; however knowledge regarding causes of these disorders remains incomplete" (Cheng et al., 2018, p. 505). It is important to have the knowledge base to be able to provide a comprehensive assessment of the child's overall visual perceptual skills to be able to provide the training for them to be a full participant within the classroom.

The *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance* is a training program designed to be provided to school-based occupational therapy practitioners during their designated professional development time allotted by their school district. This program is grounded in practice theories and informed by the current literature. Details on this program can be viewed in the Logic Model below in Figure 4.1 and in a larger form in Appendix A. The participants will complete a pre-course survey, attend a half-day training program in their school district during their school district professional development time, fill out a survey at the end of the training, as well as an additional post-program survey after one month to measure competence levels on the application of new skills taught (Refer to Appendix B).

Additionally, there will be a follow-up consultation with the participants to discuss the implementation of new skills acquired, and to provide additional mentoring as needed.

Figure 4.1 The Logic Model



The program is a half-day training program that consists on educating the practitioner on providing a comprehensive assessment of children's visual perceptual skills within a school-based setting. The practitioner will leave the training with the skills to be able to implement immediately in practice. They will also receive a checklist to utilize in conjunction with standardized testing to allow to the practitioner to assess functional visual perceptual skills within the classroom setting (Refer to Appendix C). Lastly, the practitioners will also have an increased understanding on best practices based upon the existing evidence for interventions to address visual perceptual deficits (Refer to Appendix D).

Intended Participants

The population served is the school-based occupational therapy practitioner. The goal of this program is to provide the school-based occupational therapy practitioner the most recent evidenced-based research of assessment and intervention methods of visual perceptual skills in a school based setting.

Program Features, Design and Delivery

The type of services that would be provided include an interactive in-person training program that would be marketed to take place on a planned professional development day in the school district. This would include case scenarios to enhance the practitioner's clinical reasoning skills. The information will be presented with evidenced-based research of the rationale and effective implementation of skills for the therapist to be able to implement immediately in practice.

When considering the training program for the occupational therapists, it would be important to utilize the principles of the Adult Learning Theory when developing the training program for the occupational therapists. The principles include "the self-directedness, need to know, use of experience in learning, readiness to learn, orientation to learning, and their internal motivation" (Knowles et al., 2015, p. 4). It is important to have the occupational therapists trained on the rationale of the training program and why it is being taught. It is important to work collaboratively and recognize that the adult learner has prior experiences that could be elicited with this program. The respect to the learner in this situation is vital to establish a collaborative relationship to achieve the overall goal (Refer to Appendix E for this Therapist Learner Profile).

In addition to the principles of Adult Learning Theory, a framework that will be included in the development of the training program will be the “Team Teaching and Learning” (TTL) Framework. This discusses five traits of teacher professional learning which include content knowledge, active learning, coherence, collective participant, and duration (Smith et al., 2020). The literature shows that when these traits were integrated into the training and the participants had an opportunity to practice newly learned skills with feedback, there appeared to be an increase in carryover of knowledge obtained and overall satisfaction. This will be measured from the post surveys and follow up meetings. Tarnow et al. (2013) discussed how there has to be a method to measure if the skills that were taught are being implemented in practice. This can be achieved through the results from the surveys and mentoring the participants. It will be important to share the evidenced-based research that is guiding the training to the participants to promote effective implementation in practice (Curran, 2014; Gromoske & Berger, 2017; Mahan & Stein, 2014; Trivette et al., 2012). It is also important to understand the effectiveness of blended learning environments to give the participants the opportunity to practice newly acquired skills (Vanslambrouck et al., 2018). There needs to be a meaningful connection to the new information presented and opportunities for the participants to practice newly acquired skills and for mentoring and feedback.

Another theory that would be important to include would be the Person Environment Occupation Model. “Occupational Performance results from the dynamic relationship between people, their occupations and roles, and the environments in which they live, work, and play” (Law et al., 1996, p. 9). It is so important to recognize that the

child's occupation as a student in the classroom. The ultimate goal is allow the child to be as independent as possible to allow for full participation within the classroom.

Training on Assessment of Visual Perceptual Skills

The participants will be provided with a checklist of characteristics to assess functional visual perceptual skills within the classroom setting that would not be formally assessed as part of standardized testing. This additional tool could be used in conjunction with the standardized measures already in place to assist in identifying the etiology of the impact that the student is having functionally within the classroom. This would be in the form of a checklist that each occupational therapist can follow so that the same areas are being assessed with each student and with each therapist that is administering it. (Refer to Appendix C).

Training on Evidenced-Based Interventions

To address visual perceptual deficits, some of the most recent literature states that effective interventions can assist children to increase their overall functional visual perceptual skills (Alenzi, 2019; Chang & Yu, 2017; Chen et al., 2013; Chen et al., 2015; Howe, et al., 2013; Mehta & Nandgaonkar, 2019; Ramkumar & Gupta, 2016; Vlok et al., 2011; Wang et al., 2017). "Intervention planning requires an understanding of the underlying reasons for difficulty as well as a delineation of the conditions that influence performance" (Schneck, 2019, p. 494). Depending on the deficit area and functional impact identified in the evaluation of a child's visual perceptual skills, there were several different interventions that can be implemented. Visual perception interventions are divided into two major types: conventional activities (i.e. paper activities) and

multimedia (Chen et al., 2013; Wuang, et al, 2018).

As part of multimedia interventions studied, “Game-Based Auxiliary Training Systems (GBATS) has been proven to be effective for treating visual perceptual dysfunction in children. Game-based interventions are effective in children not only because play is a natural activity, also because children have high neuroplasticity. Neuroplasticity has the potential to change brain structure” (Wuang et al., 2018, p. 28). Visual perceptual training programs focusing on multi-sensory strategies have been effective because the learners are connecting the sensorimotor experiences to the materials presented (Alenzi, 2019; Chen et al., 2013). Another study discussed the effectiveness of a table tennis training (TTT) program to improve deficits in visual perception. The authors rationalized that this program increased their neuroplasticity within the brain as evidenced by the numerous repetitions of the TTT and multisensory feedback that the individuals received while participating in the intervention (Chen et al., 2015). These interventions are recommended as activity options during occupational therapy sessions with students. (Refer to Appendix D for a complete list of intervention activities discussed in the literature).

When participating in interventions that focused on increasing visual perceptual skills through handwriting intervention, students that participate in a handwriting program show improvements in handwriting speed, legibility, and their ability to copy from a far point surface (Chang & Yu, 2017; Howe et al., 2013; Mehta & Nandgaonkar, 2019). This intervention could easily be implemented in the classroom and outside of the classroom in occupational therapy treatment sessions. Mehta & Nandgaonkar (2019)

studied students participating in this intervention and the results indicated that all of the participants showed improvements in handwriting as evidenced by a decrease in the use of the eraser, and also showed a decrease of errors in formation of letters and use of punctuation with writing tasks upon the conclusion of the intervention program. In addition, the mothers of the study participants reported that they have seen an increase in their children's self-esteem and social interaction with others. Howe et al. (2013) reported that the students that participated in the handwriting intervention program showed increased confidence when completing their work.

Another intervention that was proven effective in the literature was the use of an ocular motor program in conjunction with a structured 12 week visual perceptual intervention program to assist individuals to increase their abilities to complete functional tasks. "The ocular motor system enables observation of the environment by aligning the muscles in the eyes to enable a clear image to be observed" (Vlok, et al., 2011, p. 31). These results showed an increase in the child's overall skills in math, reading, writing, work speed, and confidence (Vlok et al., 2011). This intervention could be implemented within the occupational therapy treatment sessions. Other intervention approaches would include education (student, teachers, parents), environmental adaptations, and addressing specific performance skills that are impacting the child throughout their school day (Schneck, 2019).

Measurement of the Program's Effectiveness

The participants will be completing three surveys: prior to the training, at the completion of the training, and one month after the program completion. The rationale of

this is for the program developer to measure change in the participants perceived level of competence (before, right at the end of the training, and after one month) as well as their practical application of skills (Refer to Appendix B). The participants will complete a survey to measure their competence level over multiple measures (5 consecutive workdays) prior to attending the training program to obtain a valid measure of their competence levels. They will complete another survey each workday for 5 weeks during the intervention phase, and at 6 weeks after completion of the training program. The surveys would have questions rated utilizing a Likert Scale to obtain a quantitative measurement that can be analyzed statistically to determine the degree of change, as well as to determine if additional changes need to be made to the training program. Additionally, there will be a follow up consultation with the participants to share the results of the outcome measures from the surveys.

Personnel: Roles and Responsibilities

Initially the developer of this educational training program will be the program instructor. As the program progresses, it would be important to have additional individuals trained in administering the program. The developer will have a training manual that will have a detailed description of the scope, length, and all of the content that will be presented during the training program. It would be important to have a detailed explanation of the intervention design, how the training program will be delivered, the data collection measures, and what outcome skills that are projected to be learned from this program (Murphy & Gutman, 2012).

Potential Barriers and Challenges

Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance is an educational training program that will be offered to occupational therapists during professional development training time, therefore would need to be approved and paid for by the school district. The districts may not have the funding within their budget to pay for this program. There may be an initial lack of interest from administration on this topic for professional development. The developer will provide an informational brochure, executive summary, fact sheet, as well as be available to answer any questions about this topic.

Another potential barrier would be having this program offered only on professional development days may not work for some districts, as they may have already have their trainings in place for their staff. Additionally, there may not be availability of staff on as professional development day due to staff schedules if not full time, or if therapists are contracted into the district and do not participate in professional development as part of their contract.

Conclusion

Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance is an educational training program designed to increase the knowledge base of the school-based occupational therapy practitioner on the assessment and intervention of visual perceptual skills with children in a school-based setting. The participants of this program will then be able to assist the child to maximize their visual perceptual skills and be a full participant within the classroom when implementing the

newly acquired skills.

CHAPTER FIVE

Program Evaluation Research Plan

Measuring the outcomes that have been established for this program is vital for its success. As stated in Chapter 4, there is a gap in the literature regarding in providing a comprehensive assessment of visual perception with children in the school-based setting. The ultimate goal is to provide an evidenced-based training program to the occupational therapy practitioners that educate them on having the tools and increased knowledge base to be able to bridge this gap. It is also important to have the results from the surveys to assist with refinement and growth of the program.

This chapter will describe the program evaluation research plan for the *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance* training program. This plan includes a multiple baseline single subject research design incorporating qualitative and quantitative measurements from the participants. This is intended to measure the degree of change with the competence level of the occupational therapy practitioners.

Program Scenario and Stakeholders

This training program will provide education and training for occupational therapy practitioners on assessment and intervention for children in a school-based setting with visual perceptual skill deficits, and also guidelines regarding accommodations and strategies for the classroom. “Occupational Therapists need to be equipped to conduct a thorough assessment, so that they can link the child’s performance deficits to correct foundational factors” (Sullivan et al., 2018, p. 90). This program aims

to equip occupational therapy practitioners with the tools to conduct thorough assessments.

Initially, the training program would be designed for school-based occupational therapy practitioners who evaluate and treat students in the classroom setting to provide them with the tools needed to thoroughly assess and identify functional visual perception deficits. Once the occupational therapy practitioner completes the training and has achieved a level of competence for providing visual function and perception assessment of the child, he or she would then provide treatment and education to the student in the classroom on accommodations and strategies to be successful and be a full participant in the classroom. Additionally, the classroom teacher would be involved in the training of accommodations and strategies to carry out with the student throughout each school day. In addition, the occupational therapy practitioner will work collaboratively with the classroom teacher and provide feedback on the implementation of the accommodations and strategies to the treating occupational therapist on the students' overall performance.

Vision for the Program Evaluation Research

Upon implementation of this program, the author envisions that participating occupational therapy practitioners will demonstrate improved competence in administering thorough visual perceptual assessments and detecting functional visual perceptual deficits in a school-based setting. Once this information is identified, the occupational therapy practitioner is envisioned as having the knowledge and skills needed to work with the student on increasing his or her overall visual perceptual skills. Additionally, the occupational therapy practitioner will also work with the classroom

teacher on accommodations and strategies to provide to the student throughout their school day to allow for full participation as much as possible. If the classroom teacher is trained in accommodating visual perceptual deficits in the classroom, a change that could be fulfilled would be increased independence of the children in the classroom setting, as well as a decrease in number of referrals for occupational therapy evaluations to address these issues.

Engagement of Stakeholders

Key stakeholders within the school district where the trainings will take place will include the following individuals: Superintendent of Schools, Assistant Superintendent of Student Services, Assistant Superintendent of Curriculum, occupational therapy practitioners, Special Education Supervisors, building principal, and specialist teachers that work with the student.

- The Superintendent of Schools would need to provide approval and endorsement for the training program to occur.
- The occupational therapy practitioners will be the service providers that will be attending the training and completing data collection throughout the process. They will be completing the surveys prior to the training, upon completion of the training program, and one month after the training to provide data on the effectiveness and importance of the newly acquired skills and how it is being applied to practice.
- The Assistant Superintendent of Curriculum would be a valuable stakeholder to share data and discuss if any modifications are needed to the curriculum that is

currently in the district to help students that present with a profile of visual perceptual deficits.

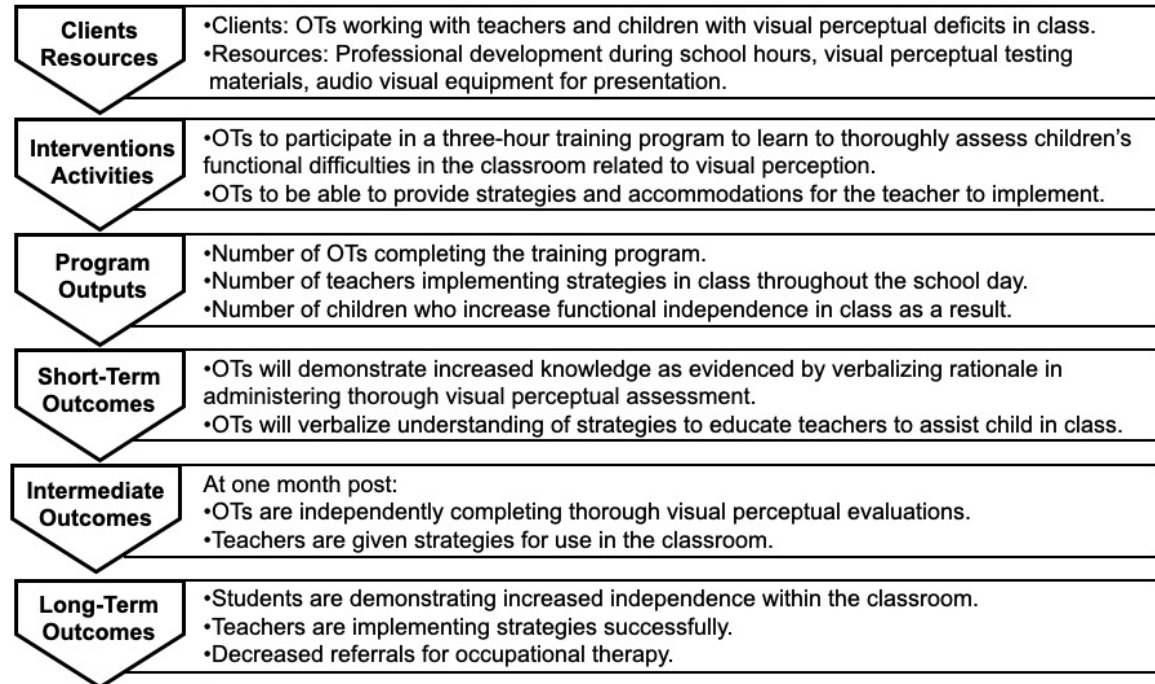
- The Assistant Superintendent of Student Services and Special Education Supervisors are important stakeholders because they are involved in monitoring and completing the referrals for students that require an occupational therapy evaluation as well as keep data on students receiving special education services in the district.
- The building principal would be a valuable stakeholder as they oversee what is happening in the school, as well as they are responsible for providing proper staffing for the classrooms, and would need to provide approval should there be a need to provide additional staffing for students with special needs.
- The specialist teachers would be important stakeholders as they also work with the students in the classroom and could also work collaboratively with them with the students.

The author would share the evidence-based research addressing the impact of visual perceptual deficits on a child's full participation within the classroom. For the administration personnel, the author will share how this relates to the special education laws, particularly Free and Appropriate Public Education [FAPE], (United States Department of Education, 2010). Additionally, she will share the amount of money the district could save in having a teacher easily implement the learned strategies as opposed to having an additional staff member, such as a paraprofessional, having to be in the classroom to provide additional support to the child throughout their school day. For the

classroom teachers, specialist teachers, and occupational therapy practitioners, the author would provide the rationale for development of this program and explain why there is such a need for it. She would include how implementation of the program would increase the independence of the student. In turn, this would increase their confidence and emotional well-being, as well as their ability to be a full participant within the classroom.

Simplified Logic Model for Use with Stakeholders

The simplified logic model below explains the program. The occupational therapy practitioner completes a training program to increase their knowledge base in assessment of visual perceptual deficits of elementary aged children. After the occupational therapy practitioner completes an assessment of a student, they will train the classroom teacher on accommodations and strategies that they can use to implement with the child throughout their school day to maximize the child's independence within the classroom. The program output is to increase the knowledge base of the occupational therapist to be able to train the teachers to help the child throughout the school day to allow the child to achieve optimal independence within the classroom. With the teachers increasing their success in addressing visual perceptual deficits with children in the classroom, it could possibly lead to a decrease in the number of referrals for occupational therapy evaluations.

Figure 5.1 Simplified Logic Model

Preliminary Exploration and Confirmatory Process

The author would propose holding a meeting where all of the stakeholders will have an opportunity to attend. In addition to the occupational therapy practitioner and classroom teacher, the following individuals would be important to include as key stakeholders to explain the proposed participatory approach: Superintendent of Schools, Assistant Superintendent of Student Services, Assistant Superintendent of Curriculum, Special Education Supervisors, building principal, and specialist teachers.

In this meeting with all of the stakeholders, the author would provide background information on the proposed project. In addition, the author would provide the rationale of the proposed training program for the occupational therapy practitioners that would attend, as well as explain how it would increase their competence in assessing visual

perception as part of a school-based occupational therapy evaluation and its impact on student's overall school functioning. Hanft and Place (1996) discuss how "occupational therapists assist children in a school-based setting to maximize their readiness to learn and addressing student disability in academic performance in the least restrictive environment" (p. 4-5). Occupational Therapists are proficient in administering standardized visual perceptual testing and making clinical observations of the students that are evaluated in a school-based-setting, but there is a missing link with some of the students when the standardized test results are compared to their overall performance within the classroom. This impacts the student's independence in the classroom.

The author would present the evidenced-based research findings she has obtained. Goldstand et al. (2005) describe that "there is insufficient data to support a possible effect that visual deficits may impact performance on higher-level visual-information processing assessments, such as those that evaluate visual-motor integration and visual perception" (p. 379). Brown and Gaboury (2006) state that "It is important for occupational therapists to know how the instruments and scales they use in clinical practice are developed, the reliability scores obtained in the standardization process, the validation procedures used to create them, and any inherent weaknesses and limitations they might possess" (p. 183). As part of the training program, the author will have a tool that the occupational therapy practitioner can use in addition to standardized testing that allows them to thoroughly assesses visual perceptual skills and the impact that the student is having functionally in the classroom.

The overall outcome that that the author is hoping to establish during her program

evaluation research is to discover the gap that links visual perceptual deficits and its relevant impact on overall school functioning. The author plans to take this new information and then educate other practitioners to acquire expertise in this area. Children with deficits in visual-perception present with limitations in occupational performance in all aspects of their life. The World Federation of Occupational Therapists (2012) states “In occupational therapy, occupations refer to the everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. Occupations include things people need to, want to and are expected to do” (para. 2). A child’s main occupation is being a student and attending school, so the focus of the program will be on their ability to be as independent as possible as a student, but be mindful that having visual perceptual deficits can impact all parts of their life.

When referring to the “Occupational Therapy Practice Frameworks: Domain and Process-Fourth Edition” (American Occupational Therapy Association, 2020), impairments in visual perception can impact areas across all occupations. This can impact a student’s ability to perform activities of daily living, instrumental activities of daily living, education, play and leisure. Under client factors, it can impact memory, perception, sensory functions (visual, proprioceptive), and movement functions (control of voluntary movement). Under performance skills, it may impact motor skills (positions, reaches), and process skills (sequences, searches, locates, gathers, organizes, restores, navigates, adjusts, accommodates, benefits). Under performance patterns, it can impact their habits, roles, and rituals as an individual person or in a group. Under context and environment, it is important to be mindful of their culture and environment when

considering the overall impact on occupational performance. Under occupational therapy interventions, it is important to be looking at preparatory methods, preparatory tasks, and advocacy. All of the above will identify the problem, and then can help address the approaches to interventions and outcomes for optimal independence.

While the actual “cause” of deficits in visual perception is still unclear, it is important to identify what areas of occupational performance are impacted. For example, in the school setting, some students struggle to form letters and numbers as well as form letters and numbers backwards, not be able to organize their written work on their paper, have difficulty organizing their workspace/desk, difficulty with visual scanning abilities which impact reading, and may have difficulty finding objects on a table or in their desk. Through the training program, the author hopes that the occupational therapy practitioner can help identify how these deficit areas can impact a student in a school setting within the classroom, and to be able to educate members of the school team about how to address these areas across the student’s day to help increase the student’s independence. The student may also have an underlying visual issue that is not being addressed. It would be important initially to rule out if this child needs corrective lenses to address the performance challenges that they may be experiencing. Once that is ruled out, it would be important to address the problems the student is facing and provide assistance and accommodations in collaboration with the educational team to help the student be successful. The end product could be in the form of professional development for the educational team.

The author would also provide the rationale of the importance of each

stakeholder's input. Each individual stakeholder would be looking at this project through the "lens" of their expertise, and having all of the input will allow for a well-rounded developed program. It would be imperative to acknowledge the varied shared experiences and input of each stakeholder would be so valuable to the final project to be presented. The author would need to present the research-based rationale to the stakeholders why this program should be implemented at their district and why there is such a need for it. The author would also include that implementation of the program would help facilitate increased independence of the student.

Table 5.1 Program Evaluation Research Questions by Stakeholder Group

Stakeholder or Stakeholder Group	Types of Program Evaluation Research Questions
Myself as author and researcher	• Will the occupational therapy practitioners that have completed the training increase their competency and perceived comfort level in assessing visual perceptual deficits with students in the school based setting? • Will the occupational therapy practitioners perceive that they have the tools they need to provide strategies to the classroom teacher for the student that is being evaluated?
Occupational Therapists participating in the training program	<i>(prior to the training program):</i> • How competent do you feel in evaluating visual perceptual deficits with children in the school-based setting? • Do you feel that you have the tools to be able to provide intervention to help this child be successful in the classroom? <i>(at the completion of the training program):</i> • How competent do you feel in evaluating visual perceptual deficits with children in the school-based setting? • Do you feel that you have the tools to be able to provide intervention to help this child be successful in the classroom? • How did you like this training program? • What are your suggestions for improvements to the training course?

	<i>(after one month of the training program):</i> • Rate your current ability to capture the causes of occupational performance deficits in the classroom when you are evaluating a child with visual perception issues. • Rate the degree to which you currently feel that you have the tools to provide intervention that will help a child with visual perceptual issues to be successful in the classroom. • Rate your level of confidence in your ability to effectively provide accommodations and strategies to the classroom teacher so that he or she is able to carry them out throughout the child's school day.
Teacher survey	<i>(survey prior to implementation of strategies and after implementation of strategies after 1 month)</i> • How much support does this child require by the teacher as compared to their peers to participate in general classroom tasks (navigating school environment, organization of personal belongings, locating personal items)? • How much support does the child require by the teacher as compared to their peers to participate in academic tasks (reading, math, writing) in the classroom? • Do you feel that the child's difficulties are causing them to fall behind their peers?

Formative Research Design

In addressing the formative design, the author will be having the occupational therapy practitioners that are attending the training complete a survey prior to the course, at the end of the training course and at one month after completion of the training course. The participants complete a survey with a mixture of questions that are rated using a Likert Scale to obtain quantitative data, as well as open ended questions at the end of the training program to ask for feedback for suggestions as to how to improve the course for future trainings (Refer to Appendix B). These surveys would be generated through electronically through Google Forms.

Summative Research Design

In the summative aspect of the research, the author would be taking the data from the surveys that the occupational therapy practitioners completed prior to and upon the conclusion of the training program to assess measuring change in knowledge, perceived level of confidence and perceived level of preparedness. There would also be a survey that they would be asked to complete after one month of implementation of newly learned skills in practice. The outcome would be the occupational therapy practitioners demonstrating an increase in their knowledge base, competence, and perceived preparedness. The surveys would have questions rated using a Likert Scale to obtain a quantitative measurement that can be analyzed statistically to determine degree of change in the above stated behaviors. The author would plan to administer a survey prior to and at the completion of the training program to the occupational therapists on their competency of assessing and treating students within a school setting. For collecting summative/quantitative outcome data, the author would have the occupational therapy practitioners complete the survey at the end of the course and one month post completion of the training. It would include the occupational therapy practitioner's experiences with evaluations after their completion of the training. This would be a measurable rating scale that measures the behaviors and function in the classroom prior to receiving intervention and assistance in the classroom and after. Having pre and post data will be important to rationalize whether the treatment, accommodations, and strategies are working for the student in the classroom. This information could be presented to all stakeholders to justify if the program met the proposed objectives, to check the fidelity of the program to

see if additional services or interventions are needed to assist the child in the classroom, as well as modify the program as needed. This would also encourage collaboration and agreement of all of the stakeholders of the program. These surveys would be generated through electronically through Google Forms. (Refer to Appendix B).

Methods

For this program, the author will be applying for and obtaining Institutional Review Board IRB approval through Boston University. Prior to completion of the application for IRB approval, the author would complete the Mandatory Online Certification for Researchers course. Once the author obtains certification, an expedited short IRB form will be completed. The Confidentiality Agreement Form (CDA) that is on Boston University's IRB website will be completed for each of the program participants. This will ensure confidentiality for each of the participants. Each participant will receive a code designation, and that will be used throughout the process which will be used throughout for data analysis. All of the data collected from the surveys will be saved in a password protected file, and will only be made accessible by the researcher.

Formative Data Collection Methods

- **Setting:** The initial training program will be taken place at Colonial Park Elementary School in Stoneham, Massachusetts. The participants will be asked to complete surveys prior to the program, at the completion of the training program, and after one month of the training program. There are two other elementary schools in the district (Robin Hood Elementary School and South Elementary School), so the occupational therapy practitioners will complete the one month

post training program survey at these schools. These surveys will be completed electronically.

- **Participants:** The participants are the occupational therapy practitioners that work for Stoneham Public Schools in Stoneham, Massachusetts. They will be participating in the training program.
- **Qualitative information gathering:**
 - The surveys that the occupational therapy practitioner will be asked to complete will be completed electronically.
 - The encounters will be assigned as follows: The occupational therapy practitioner will be assigned to the training on a school designated professional development day. Once they have completed the training, they would apply new skills when completing school-based occupational therapy evaluations on students that have signed consent forms to be evaluated for occupational therapy at their elementary schools.
 - The author (Carole Dinan) will be responsible for retrieving the data from the surveys online. The author would utilize a secure back up system for all of the files.
 - As part of the research questions that look at qualitative data, it is imperative to establish trustworthiness. Using triangulation technique, it is using multiple methods (occupational therapy practitioners to assess and provide training to the classroom teacher, and classroom teachers to provide strategies and accommodations and provide input on functional

outcomes of the student) to have a more thorough view of visual perceptual deficits and effective implementation in the classroom.

- **Timing:** The data collection process includes the following: The occupational therapy practitioners will complete the surveys prior to and at the end of the training program and then another one month following the training program.

Formative Data Management Analysis

- For the surveys that the occupational therapy practitioners have to complete, there will be open ended questions. The surveys will be completed electronically through Google Forms and the results will be obtained and transcribed as they come in.
- The author feels that the best analytical approach to interpret the open ended questions from the survey is using explanatory methods. The main objective of this whole program is to have the occupational therapy practitioner have the tools to assess and identify how visual perceptual deficits are impacting the student in the classroom. By having the occupational therapy practitioners provide feedback through open ended questions about the training program, this will help connect the program to the expected outcome. By obtaining the data, the program can be altered as identified to allow for improvements in the program.
- The author will utilize NVivo for planning purposes to generate response codes or themes. Using this software would allow the author to organize the information obtained from the surveys and code it electronically. The author would also use manual coding as well to help organize and make sense of the qualitative data

obtained. From obtaining this information the author can go line by line when looking at the open ended questions and can cross reference the answers to obtain the most information possible.

Summative Data Collection Methods

- **Setting:** The initial training program will be taken place at Colonial Park Elementary School in Stoneham, Massachusetts. At the completion of the training program and after one month, the occupational therapy practitioners will be asked to complete a survey about the training program. There are two other elementary schools in the district (Robin Hood Elementary School and South Elementary School), so the occupational therapists will complete the one month post training program survey at these schools. The surveys that the occupational therapy practitioner will be asking to complete would be to measure change in their knowledge base and competence from prior to participating in the program, at completion of the program, and after one month of attending the program. These surveys will be completed electronically.
- **Participants:** The participants are the occupational therapy practitioners that are completing the surveys.
- **Independent variable:** The independent variable is the training program that the occupational therapy practitioners will be participating in.
- **Dependent variable:** The dependent variables are confidence and skill level of the occupational therapy practitioner in assessing visual perception.

- **Timing:** The data collection process includes the following: The occupational therapy practitioner will complete the surveys prior to and at the end of the training program and then another one month following the training program.

Summative Data Management Analysis

- The survey responses will be entered electronically by the occupational therapy practitioners through Google Forms.
- As far as the software that would be used to perform statistical analyses, SPSS would be used to analyze the information.
- The pre and post data could be analyzed statistically to determine the degree of change.

Disseminating the Program Evaluation Research Findings

The author will share the research finding of this program with the stakeholders. This would include the occupational therapy practitioners, Superintendent of Schools, Assistant Superintendent of Student Services, Assistant Superintendent of Curriculum, Special Education Supervisors, and building principal. The idea of sharing the rationale of the program and research findings with the stakeholders would contribute to their understanding and willingness to participate in or approve of implementation of the program. When considering the method of communication of the information, the author would need to use clinical reasoning skills to decide how to present the information obtained to each stakeholder. The results of the program would also be beneficial for the author to share when proposing this program to other districts. The author would want the individuals that are the recipients of the information to have an understanding of the

program and what it intending to measure, the research findings, and how change was measured.

Summary

The measure of success for this training program will be that the analysis of the data collected from the participants will indicate that providing education on administering a comprehensive assessment of visual perceptual skills with children in a school-based setting will reduce the gap that has been identified from the literature search. Through participating in this training program, the occupational therapy practitioners will increase their knowledge base and competence to assist the child to be a full participant within the classroom.

CHAPTER SIX

Dissemination Plan

The Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance program is designed to increase the school-based occupational therapy practitioners' knowledge base by providing education on the most recent and effective methods of providing a thorough assessment and intervention of visual perceptual skills with children in the school-based setting.

This program is a half day training that consists of educating the practitioner on completing a comprehensive assessment and intervention of children within a school-based setting. This program will take place on a planned professional development day in the school district. It would be an interactive training program which would include case scenarios to enhance the practitioner's clinical reasoning skills. The information will be presented with evidenced-based research of the rationale and effective implementation of skills for the therapist to be able to implement immediately in practice. The participants will be provided with a checklist of characteristics to assess functional visual perceptual skills within the classroom setting that would not be formally assessed as part of standardized testing. The participants will be completing three surveys: prior to the training, at the completion of the training, and one month after the program completion.

The rationale for the program developer to measure the perceived competence level of the occupational therapy practitioner (before, right at the end of the training, and after one month) as well as their practical application of skills. Additionally, there will be a follow up consultation with the participants to share the results of the outcome

measures from the surveys.

The practitioner will leave the training with the skills to be able to implement immediately in practice, including assessment and intervention of visual perceptual skills with children in the school-based setting. In addition, they will also receive a checklist to utilize in conjunction with standardized testing to allow to assess for functional visual perceptual skills within the classroom setting.

Integration of Theory

Two theories were chosen to guide the development and implementation of this program. The Person Environment Occupational Model (Law et al. 1996) and Adult Learning Theory (Knowles et al., 2015). In developing this program, a logic model was created while integrating the principles of these theories throughout the training (refer to Appendix A). The Person Environment Occupation Model was chosen to address the child (person), classroom (environment), and being a student (occupation). The Adult Learning Theory will guide the development of training to the occupational therapy practitioner integrating the assumptions that addresses the adult learner (Knowles et al., 2015).

Dissemination Goals

The overarching dissemination goal of *Understanding Visual Perception on School-Aged Children and Its Impact on Occupational Performance* training program would be that multiple schools across the Commonwealth of Massachusetts will agree to have this program as part of their professional development for occupational therapy practitioners in their school district.

Long term goal (within 2 years of the program starting):

- The outcome measures of the training program will indicate that this evidenced-based program is effective in providing a comprehensive assessment and intervention of visual perceptual skills with children in a school-based setting.

Short term goals (within one year of the program starting):

- The program results will inform occupational therapy practitioners by demonstrating increased knowledge as evidenced by them verbalizing rationale on administering a thorough visual perceptual assessment.
- The program results will inform occupational therapy practitioners by demonstrating increased knowledge on providing evidenced-based intervention on remediating and/or accommodating the problem areas that have been identified in the visual perceptual assessment.
- The program results will inform occupational therapy practitioners to verbalize their understanding of strategies to educate teachers to assist a child with deficits in visual perception within the classroom.

Primary and Secondary Audiences

The primary audience that will be targeted is the school-based occupational therapy practitioners. They will be the participants in the training and will be implementing the assessment, intervention, and education of strategies to the teachers and students within the classroom. The secondary audience would be school district administrators. This would include the Superintendent of Schools, Special Education

Director, Special Education Supervisor, Professional Development Coordinator. They would be important to include as they are responsible for approving and authorizing payment of this program to be implemented within their school district. They would also be the ones that would schedule this within the allotted professional development time to allow the occupational therapy practitioners to participate.

Key Messages and Dissemination Activities

The *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance* professional development program will aim to begin in September 2022. It will be initially provided to school districts in-person in the Commonwealth of Massachusetts for the school year 2022. When completing the marketing analysis to promote this program to each school district, it would be important to target clients that are interested in learning more about this topic. Table 6.1 describes an overview of the key messages and dissemination activities for the primary audience of this program.

Table 6.1 Key Messages and Dissemination Activities for the Primary Audience

Primary Audience	Key Stakeholders: School-Based Occupational Therapy practitioners
Key Messages	• To provide education to the school-based occupational therapy practitioner on the program and how it will have a positive impact on increasing their knowledge base in the evaluation and intervention of visual perception in the school-based setting. • To increase the collaboration with the classroom teacher to allow for the students to be a full participant in the classroom.
Sources	• Carole Dinan, Occupational Therapist/Developer and Program Instructor

Dissemination Activities	• Send out informational flyer to occupational therapy practitioners working in school districts. • Obtain emails for occupational therapy practitioners from area elementary schools via internet search and direct market to occupational therapy practitioners electronically. • Market through Massachusetts Association for Occupational Therapy (MAOT).
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Table 6.2 describes an overview of the key messages and dissemination activities for the secondary audience of this doctoral project. It would be important to explain the rationale and measurable positive outcomes for the school district to allow the occupational therapy practitioners to attend this training.

Table 6.2 Key Messages and Dissemination Activities for the Secondary Audience

Secondary Audience	Key Stakeholders: Superintendent of Schools, Special Education Director, Special Education Supervisor, Professional Development Coordinator
Key Messages	• The program instructor will reach out to area school districts. • Will propose that this evidenced-based program aims to be effective in educating the occupational therapy practitioners by giving them tools to be able to provide comprehensive assessment and intervention of visual perceptual skills with children in a school-based setting.
Sources	• Carole Dinan, Occupational Therapist/Developer and Program Instructor
Dissemination Activities	• Send out informational flyer and executive summary to Administration of each individual school district. • Include fact sheet of the proposed program. • Will find out how many occupational therapy practitioners are on staff in the school district that the proposed program will be completed at.

Dissemination Budget

The initial plan for the dissemination of this program begins with the development of this program, which will be done on this presenter's own time. Table 6.3 describes considerations for the dissemination budget.

Table 6.3 Budget for Dissemination Plan

Target Population	Dissemination Plan	Amount
School-Based Occupational Therapy Practitioner	• Informational flyer sent out to occupational therapists in area public schools. • Market through Massachusetts Association for Occupational Therapy. • Request to have informational flyer emailed to occupational therapy practitioners.	• \$25 for 18 flyers • \$0 • \$0 (internet search by program developer). • Cold calls to area elementary schools.
Administration	• Informational flyer to administration including the executive summary of the program. • Fact Sheet sent to each school. • Mail through United States Postal Service. • Use of technology to provide additional information about the program from presenter. • Use of social media to reach out to area school districts. • Email administration of each school district.	• \$25 for 18 flyers • \$18.99 for 25 • \$.88 per flyer and fact sheet sent out • \$0 • \$0 • \$0

Evaluation of Dissemination

The dissemination of the information provided to market the training program aims to increase the knowledge base of the school-based occupational therapy practitioner on the assessment and intervention of visual perceptual skills with children in a school-based setting. The participants of this program will be able to assist the child to maximize their visual perceptual skills and be a full participant within the classroom when implementing the newly acquired skills. Measurement criteria for the evaluation of the effectiveness of the dissemination plan is as follows:

- Measure what methods of marketing the program were successful.
- Measure the number of schools that agreed to the training program out of the amount of overall districts the developer reached out to.
- Measure the number of occupational therapy practitioners that actively participated and the amount of practitioners who actively participated in the follow up surveys.
- Measure how the practitioners learned about the course in the pre/post survey.

CHAPTER SEVEN

Funding Plan

Introduction

As children present with difficulties in visual perception within the classroom setting, occupational therapy practitioners need to have an understanding of comprehensive assessment and treatment of overall visual perceptual skills to maximize their success within the classroom setting. *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance Program* is a training program designed to increase the knowledge base and skills of the school-based occupational therapy practitioner on the assessment and intervention of visual perceptual skills with children in a school-based setting. The participants of this program will be able to assist the child to maximize their independence and fully participate within the classroom when implementing the newly acquired skills obtained in the training program.

The type of services that would be provided during this professional development training would be an interactive in-person training program that would be marketed to take place on a planned professional development day in the school district. This would include review of the most commonly used standardized visual perceptual assessments for students in a school-based setting. The participants will be provided with a checklist of characteristics to assess functional visual perceptual skills within the classroom setting that would not be formally assessed as part of standardized testing. Case scenarios would be utilized to enhance the practitioner's clinical reasoning skills. The information will be presented with research based on the existing evidence of the rationale and effective

implementation of skills for the occupational therapy practitioner to be able to implement immediately in practice. Additionally, as part of the program, surveys would be completed pre and post training, and one month after the training to measure competence of skills and effective implementation in practice. The instructor would share the results of the surveys upon completion.

The population served for this program is school-based occupational therapy practitioners. The presenter of this program would initially market school districts in Massachusetts upon the initiation of this program. This would include contacting school district administrators, collaborative schools, public schools, attendees from occupational therapy practitioners that previously attended the training, Massachusetts Association of Occupational Therapy (MAOT), and social media.

Development of the Program

When planning the development of this program, there will be many things to take into consideration to plan for successful implementation. The greatest expense would be the time spent by the presenter to complete the review of the evidenced-based research and to develop the informational flyer, reaching out to school districts, and developing the training sessions. This would be completed on their own time. Please refer to Table 7.1 for details. The presenter would need to have materials for the participants to have access to during the training sessions. These materials would include; access to standardized assessments, non-standardized tools to be utilized in assessment, and intervention materials to allow for hands on learning. Please refer to Table 7.2 for details. The developer of this program will then seek funding to assist with the initial

development of this program. Other possible sources of funding are listed in Table 7.3.

Table 7.1. Budget for Dissemination

Target Population	Dissemination Plan	Amount
School-Based Occupational Therapy Practitioner	• Informational flyer sent out to occupational therapists in area public schools. • Market through Massachusetts Association for Occupational Therapists. • Obtain names of school district occupational therapy practitioners.	• \$25 for 18 flyers • \$0 • \$0 (internet search by program developer). • Cold calls to area elementary schools.
Administration	• Informational flyer to administration including the executive summary of the program. • Fact Sheet sent to each school. • Mail through United States Postal Service. • Use of technology to provide additional information about the program from presenter. • Use of social media to reach out to area school districts. • Email administration of each school district.	• \$25 for 18 flyers • \$18.99 for 25 • \$.88 per flyer and fact sheet sent out • \$0 • \$0 • \$0

Table 7.2 Budget Items for Training Materials

Activities	Cost
<i>The Beery-Butenika Developmental Test of Visual Motor Integration with subtests of Visual Perception and Motor Coordination</i> (Beery et al., 2010)	Starter kit: \$234.00
<i>Test of Visual Perceptual Skills-4th Edition</i> (Martin, 2017)	Starter kit: \$329.99
<i>Developmental Test of Visual Perception- Third Edition</i> (Brown, 2016)	Starter and complete kit: \$275.40
<i>Motor Free Visual Perception Test- Fourth Edition</i> (Colarusso & Hammill, 2015)	Starter kit: \$195.00
Puzzles	Approximately \$75
Manipulatives	Approximately \$300
School tools (i.e. scissors, rulers, etc).	Approximately \$100
Paper	Approximately \$50
Total:	\$1559.39

Table 7.3 Funding Sources

Funding Sources:	Requirements:
Elks National Foundation Beacon Grant	Beacon Grant Award Description: This would include the following individuals in need: • Children of parents that are actively serving in the military • Children that are in the foster care system • Children that have a disability • Children that are in the juvenile justice system or have apparent that is currently incarcerated • children that come from families with lower income Support: Awards are granted every year on June 1 in the amount of \$3500. Deadline Dates: Application opens June 1, 2021 and close January 17, 2022. Funds must be spent by March 31, 2022 (Elks National Foundation, 2021).

National Eye Institute Ruth L Kirschstein National Research Service Award	Ruth L Kirschstein National Research Service Award Description: Career Development Awards Institutional Training Grants Short Term Institutional Research Training Grant (T35) Program. Support: Awards are granted one time up to \$11,850. (National Eye Institute, 2021).
Salem State University	Support for Faculty Research-Internal Grants Center for Research and Creative Activities. • Recipients of this grant could receive \$4000 to fund further research or funds to be utilized for creative activities that take place in the summer. • The goal would be creating a publication, presenting at a conference, or receiving a government contract (Salem State University, 2021).
Stoneham Public Schools	Employee Professional Development: This presenter's current employer. • Will petition administration to utilize \$750 in yearly allotted funds to put toward development of the program. • Funds become available at the beginning of each school year (Stoneham Public Schools, 2021).
Massachusetts Department of Elementary and Secondary Education Early Child Special Education (ECSE) Program Federal Entitlement Grant	Early Child Special Education (ECSE) Program Federal Entitlement Grant Description: • Recipients of this grant would be able to provide services that would make certain that 3, 4, 5-year- old children that have a disability would receive a free and appropriate public education in the least restrictive environment. • This would include special education and all related services. Deadline Dates: Applications close: October 1, 2021 (Massachusetts Department of Elementary & Secondary Education, 2021).
Boston University Sargent College Student Research Grant	Sargent College Student Research Grant Description: Support: Awards up to \$5000 (Boston University, 2021).

Anticipated Cost of the Program

This program will be a fee-for-service because it will be proposed to be paid by each school district as professional development, with no additional fee being paid by the occupational therapy practitioner. The fee would be proposed ahead of time which includes a preparation meeting with administrators and the senior occupational therapist (\$75). The purpose of that meeting is to obtain background knowledge of the occupational therapy practitioner's skill levels and to be able to address the needs of the participants that will be attending the training. Next is the training preparation (1 hour) and training session (3 hours), and they will be charged at \$150/hour. Lastly there will be a \$50 charge for travel. The total cost of the training session would be approximately \$725. The only additional cost would be for handouts/tools for the participants, which is approximately \$20 per participant. At the conclusion of the training, an invoice will be submitted to the school district and request that the fee be paid within 30 days (see Table 7.4 for details of the rate information).

The presenter of this program would ask if the training could take place at their school district. A request would also be made to have a space that would allow use of the school districts smart board or projection screen to share information on a large surface to the participants during the training.

Table 7.4 Training Rate Information

<i>Training Rate Information</i>		
Prep Meeting With District	\$	75
Training Preparation	\$	150
Training Session (3 Hours)	\$	450
Amount for Travel	\$	50
Total Cost Per Training Program	\$	725

The first year there will be a professional development training scheduled once a month during the 10-month school year for a total of ten trainings. The projected net income by the end of year one is \$7750. The second year there will be a total of 15 trainings. The projected net income by the end of year two is \$11,625. The third year there will be a total of 20 trainings (two per month). The projected net income by the end of year three is \$15,500. The only varying fee would be the \$20 per participant for the cost of handouts, but that would be billed to the school district (see Table 7.5 for details on financial projections). Upon completion of the training, an invoice would be submitted to each school district (see Table 7.6 for details on the invoice).

Table 7.5 Financial Projections

School Sessions	Date	Income / Costs			
		Number Of OTs	Cost of Session	Material Cost	Total Cost For Training
School 1	8/31/22	5	\$ 725	\$ 100	\$ 825
School 2	9/30/22	3	\$ 725	\$ 60	\$ 785
School 3	10/29/22	4	\$ 725	\$ 80	\$ 805
School 4	11/30/22	3	\$ 725	\$ 60	\$ 785
School 5	12/17/22	2	\$ 725	\$ 40	\$ 765
School 6	1/31/22	5	\$ 725	\$ 100	\$ 825
School 7	2/28/22	3	\$ 725	\$ 60	\$ 785
School 8	3/31/22	4	\$ 725	\$ 80	\$ 805
School 9	4/29/22	3	\$ 725	\$ 60	\$ 785
School 10	5/20/22	2	\$ 725	\$ 40	\$ 765
Total			\$ 7,250	\$ 340	\$ 7,930
First Year Projected Yearly Income (12 Months)			\$ 7,250	\$ 500	\$ 7,750
Second Year Projected Yearly Income (12 Months)	15 Schools		\$ 10,875.00	\$ 750.00	\$ 11,625.00
Third Year Projected Yearly Income (12 Months)	20 Schools		\$ 14,500.00	\$ 1,000.00	\$ 15,500.00

Table 7.6 Invoice Sample

Carole Dinan Professional Development Training			
Invoice Number	SC12022		
Date	8/31/22		
Bill To	X Public Schools		
Description	Rate	Materials	Total Amount
X Public Schools OT Training Session 8/31/22	\$ 725.00	\$100.00	\$825.00
Invoice Total			\$825.00

Conclusion

In conclusion, this program is aimed at providing education to the school-based occupational therapy practitioner to utilize their newly acquired skills to connect the results of standardized visual perceptual assessments to the functional presentation of a child's visual perceptual skills within the classroom. This information would be presented to the school-based occupational therapy practitioner based on the most recent existing evidence for them to have a comprehensive understanding of a child's deficits.

Additionally, they would then have the tools to be able to provide intervention and education to the classroom teacher to optimize the child's learning in the classroom.

There is such a need for a comprehensive way to assess a child's overall visual perceptual skills, and this program will meet this need.

CHAPTER EIGHT

Conclusion

Developing an innovative training program for school-based occupational therapy practitioners on providing a comprehensive assessment and intervention of visual perception for children in a school-based setting aligns with the American Occupational Therapy Association's mission and vision. *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance* training program aligns with AOTA's vision 2025, as the occupational therapy practitioners will show increased competence and obtain the tools necessary to assist children to facilitate full participation within the classroom (American Occupational Therapy Association, n.d.). Through participation in this program, occupational therapy practitioners will work towards AOTA's mission by advancing their clinical practice skills through receiving education on evidenced-based research on best practices on providing assessment and intervention of visual perceptual skills with children in a school-based setting (American Occupational Therapy Association, n.d.). Currently, the research is showing that formal standardized testing is not always showing a true measure of a child's presentation of visual perceptual skills within the classroom (Brown et al., 2011; Howe et al., 2017; Richmond & Holland, 2010; Richmond & Holland, 2011; Schmetz et al., 2018; Sullivan et al., 2018). In addition, there needs to be additional measures in place that captures a child's overall presentation of skills throughout the school day (Brown et al., 2011; Howe et al., 2017; Richmond & Holland, 2011; Schmetz et al., 2018; Sullivan et al., 2018). By utilizing both formal and non-formal measures, the occupational therapy practitioner will

be able to identify the cause of the deficit and then be able to offer remediation strategies and accommodations to allow the child to fully engage in classroom activities.

Through participation in this training program, the occupational therapy practitioners will obtain the knowledge on how to bridge the gap that is currently present in the literature. This will be done by them obtaining the skills to utilize formal standardized measures in conjunction with a functional skills assessment. This will increase the quality of the school-based evaluation and increase the ease of identifying the cause of the deficit to allow the occupational therapy practitioner to have an impression of a child's overall presentation within the classroom.

This program will be offered to school districts to be held during professional development time allotted by the school district. The practitioners will obtain the skills to be able to implement immediately in practice, as well as receive additional mentoring as needed through case scenarios, surveys, and feedback. This is in alignment with the program theories that guide this project. This will allow for proper measurement of the program's success as well as to be able to obtain information to modify the program as needed. Modifications could also include expanding this program to have additional trainers to facilitate this program across a broader geographical range, have the option to teach this program remotely to attract more participants, and offering consultative services remotely to continue to expand the clinical reasoning process of occupational therapy practitioners.

By having a comprehensive understanding of the child's difficulty with functional skills in visual perception, this will assist the occupational therapy practitioner to be able

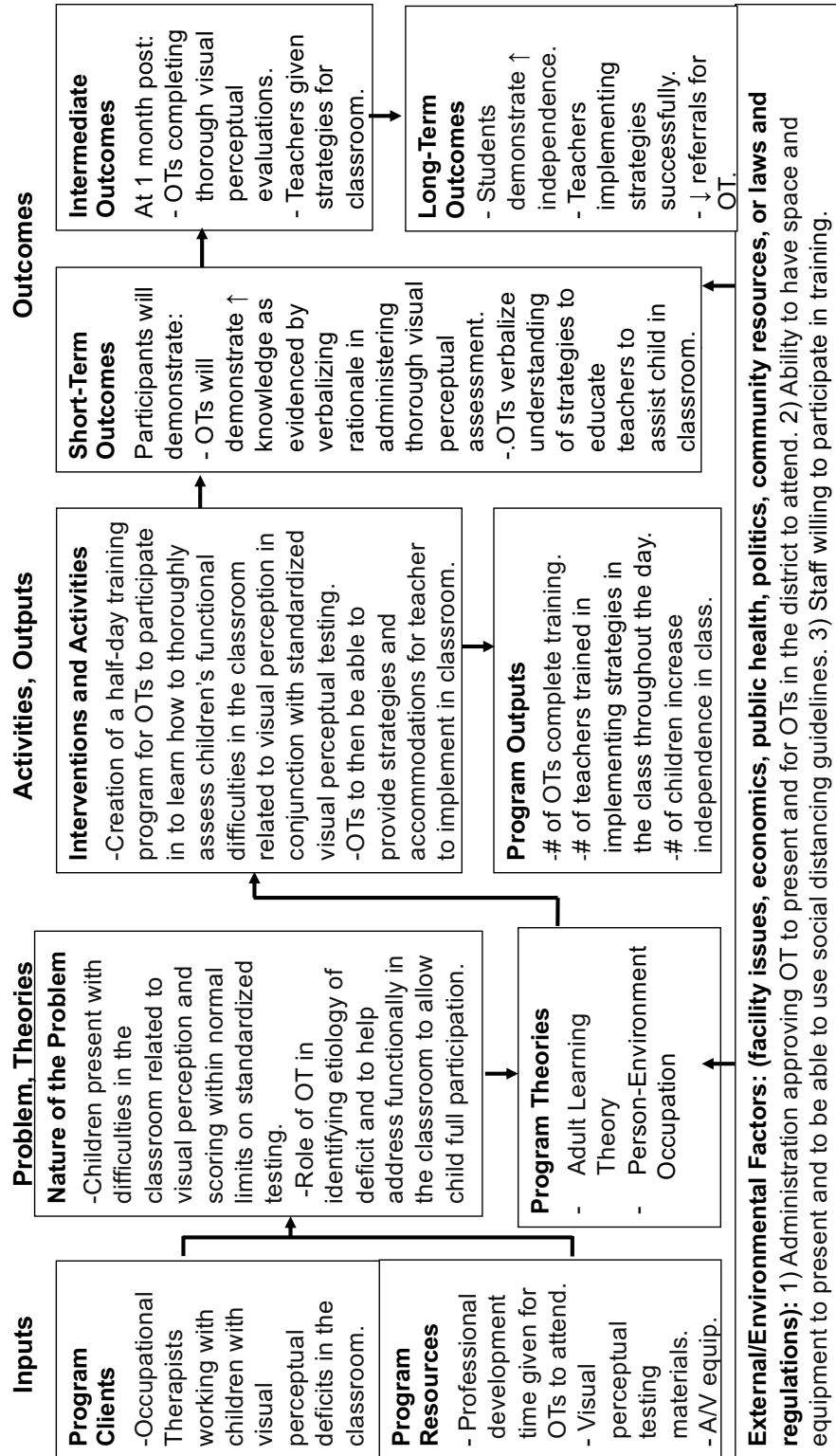
to provide innovative research treatment methods and strategies needed for generalization of skills to allow them to be a full participant within the classroom.

This program will also have the ability to further develop relationships between the occupational therapy practitioner and classroom teacher. This can be facilitated by working collaboratively on strategies to be implemented throughout the child's school day. This collaboration is so important on the effective implementation of skills and being able to have feedback on what is successful that is being implemented and to be able to make adjustments as needed. This will allow full participation of the child within the classroom.

Through implementation of this doctoral project, the author foresees positive outcomes. The school-based occupational therapy practitioner will have the knowledge, competence, and tools to be able to provide a comprehensive assessment and intervention of visual perceptual skills for children in the school-based setting. Having these newly acquired skills will allow the occupational therapy practitioner to work collaboratively with the classroom teacher to effectively implement strategies and accommodations throughout the child's school day to allow the child to be educated in the least restrictive environment (United States Department of Education, 2010). Lastly, through effective identification of deficits and successful implementation of strategies throughout the child's school day will allow them to be fully available for full participation within the school-based setting and be able to achieve academic success.

APPENDIX A: LOGIC MODEL

Program title: Understanding Visual Perception in School-Aged Children and its Impact on Occupational Performance.



APPENDIX B: COMPETENCY SURVEYS**Occupational Therapy Pre-Survey**

Please rate the following questions based on the scale below:

I feel competent evaluating visual perceptual deficits with children in the school-based setting?

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I feel competent that I have the tools to be able to provide intervention to help this child be successful in the classroom?

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

What do you hope to learn from this training?

Comments:

Occupational Therapy Post-Survey

Please rate the following questions based on the scale below:

I feel competent evaluating visual perceptual deficits with children in the school-based setting?

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I feel that I have the tools to be able to provide intervention to help this child be successful in the classroom?

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

What are your suggestions for improvements to the training course?

Comments:

Occupational Therapy Follow-up Survey

Please rate the following questions based on the scale below:

I feel competent with capturing the causes of occupational performance deficits in the classroom when evaluating a child with visual perception deficits.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I feel competent that I have the tools to provide intervention that will help a child with visual perceptual deficits to be successful in the classroom.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I feel competent in my ability to effectively provide accommodations and strategies to the classroom teacher so that he or she is able to carry them out throughout the child's school day.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

What are your suggestions for improvements to the training course?

Comments:

APPENDIX C: VISUAL PERCEPTUAL CHECKLIST

Name:	
Date of Birth:	
Age:	
Grade:	
Therapist:	
Date:	

Eye dominance:	Left	Right
Wears glasses?	Yes	No
If yes:	Distance	Close up
Date of last eye exam?		
Pass vision screening at school?	Yes	No
Take any medications?	Yes	No
Have red or watery eyes?	Yes	No
Are eyes crossed, turned in, or not moving together?	Yes	No
Excessive blinking?	Yes	No
History of headaches?	Yes	No
Sensitive to light?	Yes	No
Have double vision?	Yes	No
Place head close to work when reading or writing?	Yes	No
Moving head instead of eyes while reading?	Yes	No
Attempting to use only one eye (turn or tilt head, closing or covering one eye)	Yes	No

Visual Discrimination

Can student identify:

Comments

Symbols	Yes	No	Not observed	
Pictures	Yes	No	Not observed	
Letters	Yes	No	Not observed	
Numbers	Yes	No	Not observed	
Shapes	Yes	No	Not observed	
Words	Yes	No	Not observed	

Does the student:

Confuse similar words or numbers?	Yes	No	Not observed	
Line up scissors to cut?	Yes	No	Not observed	
Have difficulty with matching items?	Yes	No	Not observed	

Form Constancy

Does the student have difficulty in:

Comments

Detecting letters, numbers, or symbols that are different sizes, colors, or rotated?	Yes	No	Not observed	
Confusing similar letters (i.e. p, q, g & b & d)?	Yes	No	Not observed	
Confusing similar shapes?	Yes	No	Not observed	
Identifying letters and numbers that are in a different font or capital or lower case?	Yes	No	Not observed	
Unable to identify words in vertical layout?	Yes	No	Not observed	

Figure Ground

Does the child have difficulty:

Finding a word or sentence on a page?	Yes	No	Not observed	
Looking at pages with a lot of visual information?	Yes	No	Not observed	
Copying information from one surface to another?	Yes	No	Not observed	
With hidden picture activities?	Yes	No	Not observed	
Finding objects in desk or bag?	Yes	No	Not observed	
Finding a friend on the playground or in the classroom?	Yes	No	Not observed	

Visual Memory/Visual Sequential Memory

Does the child have difficulty:

Comments

Remembering what they copied?	Yes	No	Not observed	
Work slowly?	Yes	No	Not observed	
Misses words or letters when copying?	Yes	No	Not observed	
Only able to copy one letter or number at a time?	Yes	No	Not observed	
Spelling words?	Yes	No	Not observed	
Remembering phone numbers or addresses?	Yes	No	Not observed	
Recalling the alphabet in order?	Yes	No	Not observed	
Recalling correct sequence of a task?	Yes	No	Not observed	
Recalling correct sequence when telling a story?	Yes	No	Not observed	

Visual Spatial Skills

Does the child have difficulty:

Comments

Relating objects to each other?	Yes	No	Not observed	
Spacing within a word and between words when writing?	Yes	No	Not observed	
Placing written work appropriately on the line of the paper?	Yes	No	Not observed	
Form letters incorrectly?	Yes	No	Not observed	
Reverse letters and numbers?	Yes	No	Not observed	
Copying block and shape designs?	Yes	No	Not observed	
Drawing shapes?	Yes	No	Not observed	
Using maps and graphs?	Yes	No	Not observed	
Does not understand spatial concepts in relation to themselves	Yes	No	Not observed	

(top, bottom, in front, in back, beside, between, left and right)?				
Putting on clothes correctly?	Yes	No	Not observed	

Visual Scanning

Does the child have difficulty:

Comments

Staying in place when reading?	Yes	No	Not observed	
Working from left to right?	Yes	No	Not observed	
Get tired quickly when reading?	Yes	No	Not observed	
Copying from the board?	Yes	No	Not observed	
Catching, hitting, and kicking a ball?	Yes	No	Not observed	

Visual Closure

Does the child have difficulty:

Comments

Finding an item when only part of it is able to be seen?	Yes	No	Not observed	
Completing dot to dot?	Yes	No	Not observed	
Needs whole item in field of view in order to copy it (nothing can be hidden)?	Yes	No	Not observed	

Adapted from:

Gentile, M. (2005). *Functional Visual Behavior in Children* (2nd Ed.). AOTA Press.

Scheiman, M. (2002). *Understanding and managing vision deficits: A guide for occupational therapists*. (2nd ed.). Slack, Inc.

Therapy Fun Zone. (n. d.). Visual perceptual skills.

<https://therapyfunzone.net/blog/ot/visual-perceptual-skills>

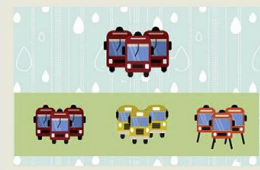
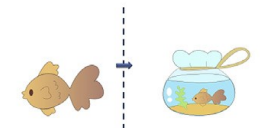
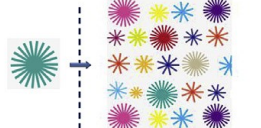
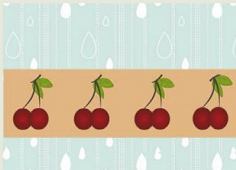
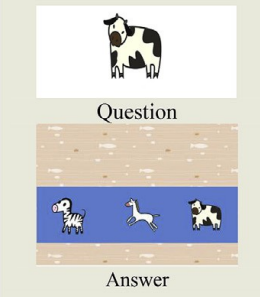
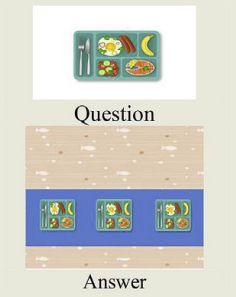
Tools to Grow. (2016). What to know and how to develop visual perceptual skills preschool through school age children. www.toolstogrowot.com

APPENDIX D: VISUAL PERCEPTUAL EVIDENCED BASED INTERVENTIONS

Game-Based Auxiliary Systems

- Digital game based interventions to target visual perceptual skills increase automatic learning in children by providing intensive sensory motor stimulation and feedback
These include digital games such as matching, visual search activities, visual discrimination activities, and visual memory.

Example of digital game-based intervention

Test Type	Difficulty Level		
	Low	Medium	High
Visual discrimination			
Visual search			
Visual spatial relationship			
Visual form constancy			
Visual memory			

(Wuang et al., 2018, p. 32)

Table Tennis Training Program

Table tennis training programs include the planning and use of complex motor-skills while receiving multisensory feedback. This improves neural plasticity and executive functioning.

Handwriting Intervention

Motoric paper and pencil activities which would include:

- Paper and pencil activities (tracing, dot to dot, mazes, find hidden objects in the picture, silhouette matching)
- Training on sequence of letter formation, proper spacing within a word and between a word, alignment of written work on the lines of the paper.
- Repetition of letter and number formation
- Drawing and coloring

Ocular Motor Program

12-week program that involves exercises with the goal of aligning the muscles of the eyes to be able to see an image clearly. This would consist of ocular motor control exercises such as:

- convergence
- divergence
- saccades
- pursuits
- fixation

APPENDIX E: THERAPIST LEARNER PROFILE

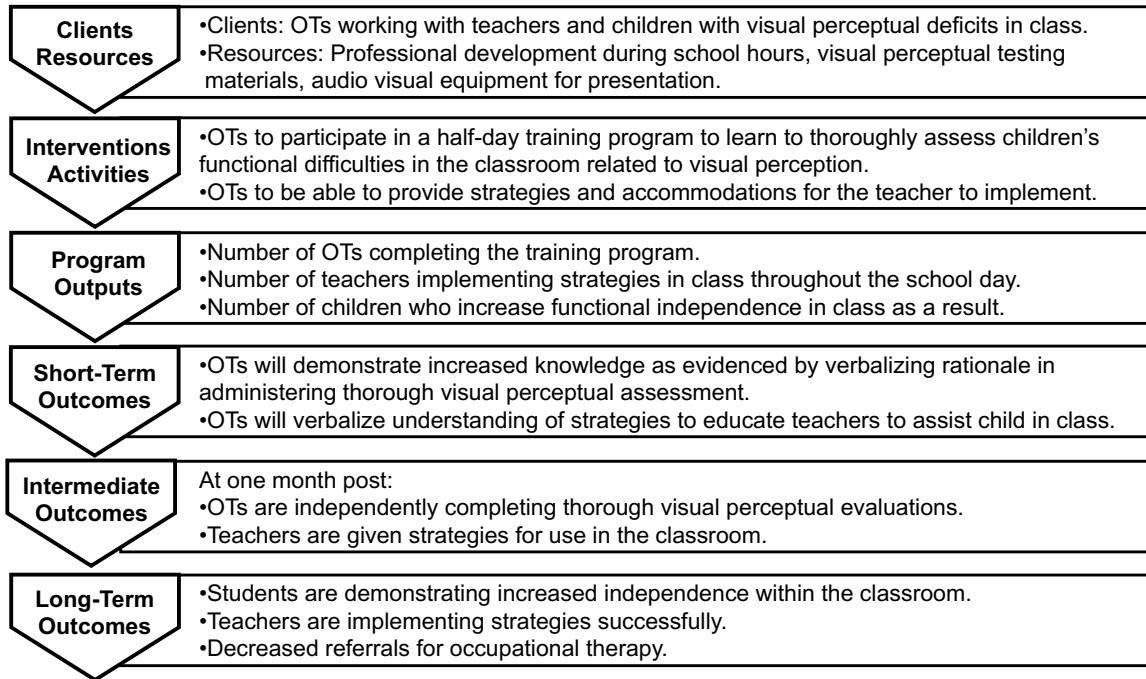
The overall purpose of this survey is to identify your specific learning needs and preferences as a learner. This information will be utilized to individualize the visual perceptual training program.

Occupational Therapist:	
Grades working with:	
Student ages:	
Learner characteristics:	
	What are your strengths as a learner?
	What are your areas of weakness as a learner?
	What do you want to learn more about to help the students in your classroom?
	Have you worked with students with weaknesses in the area of visual perception before?
Learning needs:	
	What do you need and want to learn to increase your confidence?
	When do you feel most receptive to learning?
	What do you think your biggest barriers to learning are?
	Which obstacles have you encountered in the past when you have been learning new skills?
	What do you feel you want to learn to best help your students?

Learning preferences:	
	How do you feel you learn best? (circle all that apply) Visually: • Handouts • Visual supports/ “cheat sheets” for classroom • Articles/shared documents to refer to • Other: Auditory: • Individual consultations • Presentations • Discussions/case studies • Other: Tactile • Taking notes as you are learning • Highlighting materials as you are learning • Other: Kinesthetic: • Practicing in context of classroom with being observed and getting feedback • Observing another teacher applying skills within context of classroom • Other:
Motivation:	
	What motivates you to learn?
	How do you prepare yourself to be ready to learn?
	What do you think you can accomplish at this time when working with students with weaknesses in the areas of visual perception with the resources that you have?
Goals:	
	How did it feel when you accomplished a previous set learning goal, and what support did you have to help achieve that goal?
	What are your professional goals for this school year?

	How do you think it will feel to be able to accomplish the goal?
	How can the occupational therapist best support you in your classroom?

APPENDIX F: SIMPLIFIED LOGIC MODEL



APPENDIX G: EXECUTIVE SUMMARY

Introduction

Elementary school-aged children that have impairments in visual perception can present with weaknesses impacting their occupational performance as a student in the classroom. This can result with them having difficulty keeping up with the demands of classroom work.

The World Federation of Occupational Therapists states “In occupational therapy, occupations refer to the everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. Occupations include things people need to, want to, and are expected to do” (World Federation of Occupational Therapists, 2012, para. 2). In our role as a school-based occupational therapist, we are a part of an interdisciplinary team working to assist students to be full participations in their occupation as a student.

When a child is presenting with impairments that are impacting their performance in the classroom, the occupational therapist is often called to evaluate the student and identify what is causing their impairment as well as provide a treatment plan and strategies for the child in the classroom. The occupational therapist needs to have a comprehensive understanding of the visual system as well as the functional impact it has on visual perception (Sullivan et al, 2018). Occupational therapists need to use proper evaluation methods that provide correct and reliable outcomes. This is required in order to provide appropriate interventions to the child and assist their availability for learning and increased functioning within the classroom (Richmond & Holland, 2011). By not

having all of the details as to why a particular student is struggling can result in difficulty identifying the root cause and address appropriately in a school-based setting.

There are several standardized assessments that occupational therapists use to assess a child's visual perceptual skills when completing an evaluation in a school-based setting.

In reviewing the literature, standardized assessments evaluate visual perception on a two-dimensional perspective and not on a three-dimensional perspective" (Brown et al., 2011, p. 21). There currently is not one assessment that is able to provide an overall profile of a child's visual perceptual skills (Howe et al., 2017). Most of the standardized evaluations measure visual perception, but provide only an overall score without providing a rationale on what this means functionally for the child (Schmetz et al., 2018). There is a lack of evidence that correlates the functional presentation of a child within the classroom in conjunction with the results of the standardized assessments (Brown, et al., 2011; Howe et al., 2017; Richmond & Holland, 2010; Richmond & Holland, 2011; Schmetz et al., 2018; Sullivan et al., 2018). If the occupational therapist wants to have a comprehensive understanding of a child's overall visual perceptual skills, they would need to utilize multiple assessment tools as well as non-standardized checklists to understand the functional impact that this child is experiencing within their occupational performance as a student within the classroom (Brown et al., 2011; Howe et al., 2017; Richmond & Holland, 2011; Schmetz et al., 2018; Sullivan et al., 2018). It is important for the school-based occupational therapy practitioner to have knowledge on how their impairments impact them functionally within the classroom. In comparison of common

standardized assessment tools, the evidenced-based literature found that the results of the testing do not consistently demonstrate the overall functional presentation of the student's academic skills (Richmond & Holland, 2011). Sullivan et al. (2018) concluded that additional research is required to connect impairments with visual processing and function, and to have a comprehensive visual perceptual assessment to elicit and support occupation-centered practice.

It is essential that occupational therapy practitioners have the tools to be able to conduct an evaluation of a child's visual perceptual skills. This is required in order to be able to identify what are the underlying problem areas are and how that is impacting a child functionally within the classroom (Sullivan et al., 2018). Once the occupational therapy practitioner has the proper tools to be able to provide a comprehensive assessment of the child's overall visual perceptual skills including standardized and non-standardized measures, this will then assist them to guide treatment and accommodations to allow the student to be successful within the classroom.

Program Overview

Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance is an educational training program for the school-based occupational therapy practitioner. The mission of this training program is to provide a half-day training program to the school-based occupational therapy practitioner on comprehensive assessment and intervention methods of visual perceptual skills with children in the school-based setting.

They will also receive a checklist to utilize in conjunction with standardized

testing to allow to the practitioner to assess functional visual perceptual skills within the classroom setting. Lastly, the practitioners will also have an increased understanding on best practices based upon the existing evidence for interventions to address visual perceptual deficits through interventions as well as provide accommodations for the classroom.

The type of services that would be provided include an interactive in person training program that would be marketed to take place on a planned professional development day in the school district. This would include review of the most commonly used standardized visual perceptual assessments for students in a school-based setting, as well as a checklist of characteristics to assess functional visual perceptual skills within the classroom that would not be formally assessed as part of standardized testing. Additionally, case scenarios would be utilized to enhance the practitioner's clinical reasoning skills. The information will be presented with evidenced-based research of the rationale and effective implementation of skills for the therapist to be able to implement immediately in practice.

Theoretical Frames of Reference

There are two theories that support the training program *Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance*- The Person Environment Occupation Model (Law et al. 1996) and Adult Learning Theory (Knowles et al., 2015).

The Person Environment Occupation model looks at how the person responds within their environment and while performing occupations (Law, et al., 1996). This

theory encourages a collaborative therapist and client relationship and encourages the client to be successful in meaningful occupations in a motivating environment (Strong et al., 1999). This training module would describe the “person” as the child. The “environment” would describe the classroom that the child spends their school day in, and the “occupation” describes the child’s role as a student within the classroom. Law et al. (1996) defines occupational performance as “the dynamic experience of a person engaged in purposeful activities and tasks within an environment” (p. 16). The training module would also be guided by making sure the student is participating in meaningful and purposeful activities within the classroom while having the visual perceptual needs addressed.

The other theoretical framework that is being utilized for this project is the Adult Learning Theory (Knowles et al., 2015). This theory addresses the adult occupational therapy practitioners as learners (adult learners) as they are educated on the training program. There are six principles that addresses the adult learner; they want to know the rationale of what is being taught, their self-concept, previous knowledge, availability to learn, if they are interested in learning, and if they want to learn (Knowles et al., 2015). These principles will be intertwined into the program. An explanation will be given on what visual perception is, what the rationale of the training program is, and how the strategies could be implemented with ease in the classroom. There will be some independence given within the program to allow the strategies to be integrated as the adult learner can fit it into the culture of the classroom, which could address the self-directedness of the adult learner. The background education and prior experience of the

adult learner will be considered as the program is being delivered and tailored based on past experiences. The program will address the readiness of the adult learner and address their willingness to participate as presented with evidenced-based research.

Funding

When planning the development of this program, there will be many things to take into consideration to plan for successful implementation. The greatest expense would be the time spent by the presenter to complete the review of the evidenced-based research and to develop the informational flyer, reaching out to school districts, and developing the training sessions. This initial preparation would be completed on the presenter's own time. The presenter would need to have materials for the participants to have access to during the training sessions. These materials would include; access to standardized assessments, non-standardized tools to be utilized in assessment, and intervention materials to allow for hands on learning. The developer of this program will then seek funding to assist with obtaining these materials, which would consist of local resources and grants.

This program itself will be a fee-for-service because it will be proposed to be paid by each school district as professional development, with no additional fee being paid by the occupational therapy practitioner. The fee would be proposed ahead of time which includes a preparation meeting with administrators and the senior occupational therapist (\$75). The purpose of that meeting is to obtain background knowledge of the occupational therapy practitioner's skill levels and to be able to address the needs of the participants that will be attending the training. Next is the training preparation (1 hour)

and training session (3 hours), and they will be charged at \$150/hour. Lastly there will be a \$50 charge for travel. The total cost of the training session would be approximately \$725. The only additional cost would be for handouts/tools for the participants, which is approximately \$20 per participant. At the conclusion of the training, an invoice will be submitted to the school district and request that the fee be paid within 30 days.

The presenter of this program would ask if the training could take place at their school district. A request would also be made to have a space that would allow use of the school districts smart board or projection screen to share information on a large surface to the participants during the training.

Measurement of the Program's Effectiveness

The participants will be completing three surveys: prior to the training, at the completion of the training, and one month after the program completion. The rationale of this is for the program developer to measure the growth with the therapist's knowledge base (before, right at the end of the training, and after one month) as well as their practical application of skills. The method of measuring the programs outcomes is to measure the perceived competence level of the therapist in administering a comprehensive assessment of visual perceptual skills in the school-based setting. The participants will complete a survey to measure their competence level over multiple measures to obtain a valid measure of their competence levels. Additionally, there will be a follow up consultation with the participants to share the results of the outcome measures from the surveys.

Conclusion

The review of evidence in the literature suggests that there is a need for this program. Through participation in this training program, the occupational therapy practitioners will obtain the knowledge on how to bridge the gap that is currently present in the literature. This will be done by them obtaining the skills to utilize formal standardized measures in conjunction with a functional skills assessment. This will increase the quality of the school-based evaluation and increase the ease of identifying the cause of the deficit to allow the occupational therapy practitioner to have an impression of a child's overall presentation within the classroom. This program will also have the ability to further develop relationships between the occupational therapy practitioner and classroom teacher. This can be facilitated by working collaboratively on strategies to be implemented throughout the child's school day. This collaboration is so important on the effective implementation of skills and being able to have feedback on what is successful that is being implemented and to be able to adjust as needed. This will allow full participation of the child within the classroom.

References

- Brown, T., Elliot, S., Sutton, E., Wigg, S., Morgan, D., Glass, S., & Lalor., A. (2011). The discriminative validity of three visual perception tests. *New Zealand Journal of Occupational Therapy*, 58(2), 14-22.
- Howe, T. H., Chen, H. L., Chieh Lee, C., Chen, Y. D. (2017). The computerized perceptual motor skills assessment: A new visual perceptual motor skills evaluation tool for children in early elementary grades. *Research in Developmental Disabilities*, 69, 30-38. <https://doi.org/10.1016/j.ridd.2017.07.010>
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). *The adult learner: The definitive classic in adult education and human resource development* (8th ed.). Routledge. <https://ebookcentral.proquest.com/lib/bu/detail.action?docID=1883897>
- Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The person-environment-occupation model: A transactive approach to occupational performance. *Canadian Occupational Therapy Journal*, 63(1), 9-23. <https://doi.org/10.1177/000841749606300103>
- Richmond, J. & Holland, K. (2011). Correlating the developmental test of visual perception-2 (DTVP-2) and the test of visual perceptual skills revised (TVPS-R) as assessment tools for learners with learning difficulties. *South African Journal of Occupational Therapy*, 41(1), 33-37.
- Richmond, J. & Holland, K. (2010). The relationship between a teacher checklist and standardised tests for visual perceptual skills: A South African remedial primary school perspective. *South African Journal of Occupational Therapy*, 40(3), 9-16.

- Schmetz, E., Rousselle, L., Ballaz, C., Detraux, J. J., & Barisnikov. (2018). The BEVPS: A new test battery to assess visual perceptual and spatial processing abilities in 5–14 year-old children. *Applied Neuropsychology: Child*, 7(4), 317-333.
<https://doi.org/10.1080/21622965.2017.1336710>
- Strong, S., Rigby, P., Stewart, D., Law, M., Letts, L., & Cooper, B. (1999). Application of the person-environment occupation model: A practical tool. *Canadian Occupational Therapy Journal*, 66(3), 122-133.
<https://doi.org/10.1177/000841749906600304>
- Sullivan, C., Lynch, H., & Kirby, A. (2018). Does visual perceptual testing correlate with caregiver and teacher reported functional visual skill difficulties in school-aged children? Considerations for practice. *Irish Journal of Occupational Therapy*, 46(2), 89-105. <https://doi.org/10.1108/IJOT-03-2018-0005>
- World Federation of Occupational Therapists. (2012). *Definition of occupation*.
<https://www.wfot.org>

APPENDIX H: FACT SHEET

**BOSTON
UNIVERSITY**

Understanding Visual Perception in School-Aged Children and Its Impact on Occupational Performance

Carole Dinan, OTR/L
OTD Candidate

The Problem

- Children with deficits in visual perception present with impairments impacting their full participation within the classroom.
- Standardized assessments are currently used to evaluate a child's visual perceptual skills in a school-based setting.
- The research indicates standardized assessments alone do not show an overall functional presentation of a child's skills.
- Additional strategies are required to connect impairments of visual processing with function (Brown et al., 2017; Howe et al., 2017; Schmetz et al., 2018; Sullivan et al., 2018).



source:
<https://childdevelopment.com.au/are-as-of%20concern/visual-perception/>

Proposed Solution

- Interactive half-day professional development training program at their school district for school-based occupational therapy practitioners.

Training Program Objectives

- Practitioners receive training on how to conduct a comprehensive assessment of visual perceptual skills with children in a school-based setting, including standardized assessments and contextual evaluation of performance.
- Practitioners will be educated on best practices based on existing evidence for interventions (i.e. conventional paper activities, multimedia, multi-sensory, and ocular motor programs) as well as instruction on providing accommodations for optimal independence within the classroom.
- Case scenarios will be utilized to enhance the practitioners clinical reasoning skills.



source: Getty Images



source: Getty Images

Theories Guiding Development of the Program

Person Environment Occupation Model

- How a person responds within their environment and while performing occupations (Law et al., 1996).
- Person = child; Environment = classroom; Occupation = student

Adult Learning Theory

- Educating the adult learner on the rationale of what is being taught, respecting their previous knowledge, their availability to learn, if they are interested and want to learn (Knowles et al., 2015).
- Occupational therapy practitioners= adult learners

Impact on Occupational Therapy Practice

- Through participation in this program, occupational therapy practitioners will work towards AOTA's mission by advancing their clinical skills through receiving education on evidenced-based practices on providing assessment and intervention of visual perceptual skills (AOTA, n.d.).
- This program aligns with AOTA's vision 2025, as the occupational therapy practitioners will show increased competence and obtain the tools necessary to facilitate full participation within the classroom (AOTA, n.d.).



source: Getty Images

Key References

- American Occupational Therapy Association. (n.d.). About AOTA. <https://www.aota.org/AboutAOTA.aspx>
- Brown, T., Elliot, S., Sutton, E., Wigg, S., Morgan, D., Glass, S., & Lalor, A. (2011). The discriminative validity of three visual perception tests. *New Zealand Journal of Occupational Therapy*, 58(2), 14-22.
- Howe, T. H., Chen, H. L., Cobb-Lee, C., Chen, Y. D. (2017). The computerized perceptual motor skills assessment. A new visual perceptual motor skills evaluation tool for children in early elementary grades. *Research in Developmental Disabilities*, 69, 30-38. <https://doi.org/10.1016/j.ridd.2017.07.010>
- Kidnesia. (n.d.). Visual perception. <https://childdevelopment.com.au/areas-of%20concern/visual-perception/>
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). The adult learner: The definitive classic in adult education and human resource development (8th ed.). *Boston*. <https://ebookcentral.proquest.com/lib/bul/detail.action?docID=1883897>
- Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The person- environment-occupation model: A transactive approach to occupational performance. *Canadian Occupational Therapy Journal*, 63(1), 9-23. <https://doi.org/10.1177/000841749606300103>
- Schweitzer, E., Rousselle, L., Bellah, C., Delpeux, J. J., & Benoit, J. (2018). The BEVPS: A new test battery to assess visual perceptual and spatial processing abilities in 5-14 year-old children. *Applied Neuropsychology: Child*, 7(4), 317-333.
- Sullivan, C., Lynch, H., & Kirby, A. (2018). Does visual perceptual testing correlate with caregiver and teacher reported functional visual skill difficulties in school-aged children? Considerations for practice. *Irish Journal of Occupational Therapy*, 46(2), 89-105. <https://doi.org/10.1108/IJOT-03-2018-0025>

BIBLIOGRAPHY

- Alenzi, M. A. (2019). Effectiveness of a program based on a multi-sensory strategy in developing visual perception with primary learners with learning disabilities: A contextual study of Arabic learners. *International Journal of Educational Psychology*, 8(1), 72-104. <http://dx.doi.org/10.17583/ijep.2019.3346>
- American Occupational Therapy Association. (n.d.). *About AOTA*.
<https://www.aota.org/AboutAOTA.aspx>
- American Occupational Therapy Association. (2018). Accreditation council for Occupational therapy education (ACOTE) standards and interpretive guide. *American Journal of Occupational Therapy*, 72(Supplement _2):72124100005.
<https://doi.org/10.5014/ajot.2018.72S217>
- American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process. *American Journal of Occupational Therapy*, 74(Supplement-2):7412410010. <https://doi.org/10.5014/ajot.2020.74S2001>
- Andrich, C., Hill, A., & Steenkamp, A. (2015). Training grade R teachers to impart visual perceptual skills for early reading. *Reading & Writing*, 6(1), 1-9.
<https://doi.org/10.4102/rw.c6i1.73>
- Baptiste, S. (2005). Changing face of entry to occupational therapy practice: Some personal reflections from a person environment occupation perspective. *Canadian Occupational Therapy Journal*, 52, 179-180. <https://doi.org/10.1111/j.1440-1630.2005.00512.x>

- Beery, K. E., Buktenica, N. A., & Beery, N. A. (2010). *The Beery-Buktenica Developmental Test of Visual Motor Integration, Sixth Edition (BEERY-VM I): Manual*. Pearson.
- Boston University College of Health & Rehabilitation Sciences: Sargent College. (2021, September 25). *Student research grant*.
<https://www.bu.edu/sargent/research/research-funding-%20administration/funding-opportunities-for-sargent-faculty-and-students/student-research-grant/>
- Brown, T. (2016). Validity and reliability of the developmental test of visual perception – third Edition (DTVP-3). *Occupational Therapy in Health Care*, 3, 272-287.
<https://doi.org/10.3109/07380577.2015.1136757>
- Brown, T., Elliot, S., Sutton, E., Wigg, S., Morgan, D., Glass, S., & Lalor, A. (2011). The discriminative validity of three visual perception tests. *New Zealand Journal of Occupational Therapy*, 58(2), 14-22.
- Brown, G. T., & Gaboury, I. (2006). The measurement properties and factor structure of the test of visual-perceptual skills-revised: Implications for occupational therapy assessment and practice. *American Journal of Occupational Therapy*, 60(2), 182-193.
<https://doi.org/10.5014/ajot.60.2.182>
- Brown, G. T., & Link, J. (2016). The association between measures of visual perception, visual-motor integration, and in-hand manipulation skills of school-age children and their manuscript writing speed. *British Journal of Occupational Therapy*, 79(3), 163-171. <https://doi.org/10.1177/0308022615600179>

- Brown, T., & Rodger, S. (2009). An evaluation of the validity of the test of visual perceptual skills – Revised (TVPS-R) using the Rasch measurement model. *British Journal of Occupational Therapy*, 77(2), 65-78.
<https://doi.org/10.1177/030802260907200204>
- Chang, S. H., & Yu, N. Y. (2017). Visual and haptic perception training to improve handwriting skills in children with dysgraphia. *American Journal of Occupational Therapy*, 71(2), 1-10. <https://doi.org/10.5014/ajot.2017.021311>
- Chen, M. D., Tsai, H. Y., Wang, C. C., & Wuang, Y. P. (2015). The effectiveness of racket-sport intervention and executive functions in children with mild intellectual disabilities and borderline intellectual functioning. *Neuropsychiatric Disease and Treatment*, 11, 2287-2297. <https://doi.org/10.2147/NDT.S89083>
- Chen, Y. N., Lin, C. K., Wei, T. S., Liu, C. H., & Wuang, Y. P. (2013). The effectiveness of multimedia visual perceptual training groups for the preschool children with developmental delay. *Research in Developmental Disabilities*, 34, 4447-4454.
<http://dx.doi.org/10.1016/j.ridd.2013.09.023>
- Cheng, D., Xiao, Q., Chen, Q., Cui, J., & Zhou, X. (2018). Dyslexia and dyscalculia are characterized by common visual perceptual deficits. *Developmental Neuropsychology*, 43(6), 497-507. <https://doi.org/10.1080/87565641.2018.1481068>
- Chiara Fastame, M., Cherchi, R., & Pietronilla Penna, M. (2015). The shortened visuospatial questionnaire for children: A useful tool to identify students with low visuospatial abilities. *International Journal of School & Educational Psychology*, 3(1), 49-54. <https://doi.org/10.1080/21683603.2014.917061>

- Colarusso, R. P., & Hammill, D. D. (2015). *Motor Free Visual Perception Test- Fourth Edition (MVPT-4)*: Manual. ATP Assessments.
- Collins, J. (2004). Education techniques for lifelong learning. *Radiographics*, 24(5), 1483-1489. <https://doi.org/10.1148/rg.245045020>
- Curran, M. K. (2014). Examination of the teaching styles of nursing professional development specialists, part 1: Best practices in adult learning theory, curriculum development, and knowledge transfer. *The Journal of Continuing Education in Nursing*, 45(5), 233-240. <http://dx.doi.org/10.3928/00220124-20140417-04>
- de Waal, E., Pienaar, A. E., & Coetzee, D. (2018). Influence of different visual perceptual constructs on academic achievement among learners in the NW-CHILD study. *Perceptual and Motor Skills*, 125(5), 966-988. <https://doi.org/10.1177/0031512518786806>
- Elks National Foundation. (2021, September 24). *Beacon grants*. <https://www.elks.org/cip/grants/BeaconGrants.cfm/>
- Gentile, M. (2005). *Functional Visual Behavior in Children* (2nd Ed.). AOTA Press.
- Golstand, S., Koslowe, K. C., Parush, S. (2005). Vision, visual-information processing, and academic performance among seventh-grade schoolchildren: A more significant relationship than we thought. *American Journal of Occupational Therapy*, 59, 377–389. <https://doi.org/10.5014/ajot.59.4.377>
- Gromoske, A. N., & Berger, L. K. (2017). Replication of a continuing education workshop in the evidenced-based practice process. *Research on Social Work Practice*, 27(6), 676-682. <https://doi.org/10.1177/1049731515597477>

- Hammill, D. D., Pearson, N. A., & Voress, J. K. (2014). *Developmental Test of Visual Perception-Third Edition (DTVP-3): Examiner's Manual*. ATP Assessments.
- Hanft, B. E., & Place, P. A. (1996). *The consulting therapist: A guide for OT's and PT's in schools*. (pp. 15-33). San Antonio, TX: Therapy Skill Builders.
- Howe, T. H., Chen, H. L., Chieh Lee, C., & Chen, Y. D. (2017). The computerized perceptual motor skills assessment: A new visual perceptual motor skills evaluation tool for children in early elementary grades. *Research in Developmental Disabilities*, 69, 30-38. <https://doi.org/10.1016/j.ridd.2017.07.010>
- Howe, T. H., Roston, K. L., Sheu, C. F., & Hinojosa, J. (2013). Assessing handwriting intervention effectiveness in elementary school students: A two-group controlled study. *American Journal of Occupational Therapy*, 67(1), 19-27. <http://dx.doi.org/10.5014/ajot.2013.005470>
- Individuals with Disabilities Education Act. *About IDEA*. Retrieved April 10, 2021 from <https://sites.ed.gov/idea/about-idea/>
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). *The adult learner: The definitive classic in adult education and human resource development* (8th ed.). Routledge. <https://ebookcentral.proquest.com/lib/bu/detail.action?docID=1883897>
- Lambert, K., & Spinath, B. (2018). Conservation abilities, visuospatial skills, and numerosity processing speed: Association with math achievement and math difficulties with elementary school children. *Journal of Learning Disabilities*, 51(3), 223-235. <https://doi.org/10.1177/0022219417690354>

- Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The person-environment-occupation model: A transactive approach to occupational performance. *Canadian Occupational Therapy Journal*, 63(1), 9-23.
<https://doi.org/10.1177/000841749606300103>
- Mahan, J. D., & Stein, D. S. (2014). Teaching adults-best practices that leverage the emerging understanding of the neurobiology of learning. *Current Problems in Pediatric and Adolescent Health Care*, 44, 141-149.
<http://dx.doi.org/10.1016/j.cppeds.2014.01.003>
- Martin, N. A. (2017). *Test of Visual Perceptual Skills 4th Edition (TVPS-4)*: Manual. ATP Assessments. Massachusetts Department of Elementary and Secondary education. (2021, September 24). *Early child special education (ECSE) program federal entitlement grant*. <https://www.doe.mass.edu/grants/2022/262>
- Massachusetts Department of Elementary and Secondary Education. (2021, September 24). *Early child special education (ECSE) program federal entitlement grant*. <https://www.doe.mass.edu/grants/2022/262>
- McClain Haley, A., & Matschiner, A. (2008). What every teacher needs to know about vision and reading. *Journal of Reading Education*, 33(3), 35-38.
- Mehta, P. P. & Nandgaonkar, H. P. (2019). Visual-perceptual training for handwriting legibility and speed in children with handwriting difficulties: A single-arm interventional study. *The Indian Journal of Occupational Therapy*, 51(1), 14-20.
- Murphy, S. L. & Gutman, S. A. (2012). Intervention fidelity: A necessary aspect of intervention effectiveness studies. *The American Journal of Occupational Therapy*,

66(4), 387-388. <https://www.doi.org/10.5014/ajot.2010.005405>

National Eye Institute. (2021, September 24). *Grants and funding*.

<https://grants.nih.gov/grants/guide/pa-files/PA-20-162.html>

Prunty, M., Barnett, A. L., Wilmut, K., & Plumb, M. (2016). Visual perceptual and handwriting skills in children with developmental coordination disorder. *Human Movement Science, 49*, 54-65. <https://doi.org/10.1016/j.humov.2016.06.003>

Ramkumar, S. & Gupta, A. (2016). A study on the effect of occupational therapy intervention program using cognitive perceptual and perceptual motor activities on visual perceptual skills in children with cerebral palsy. *Indian Journal of Physiotherapy and Occupational Therapy*,

Richmond, J., & Holland, K. (2011). Correlating the developmental test of visual perception-2 (DTVP-2) and the test of visual perceptual skills revised (TVPS-R) as assessment tools for learners with learning difficulties. *South African Journal of Occupational Therapy, 41*(1), 33-37.

Richmond, J., & Holland, K. (2010). The relationship between a teacher checklist and standardised tests for visual perceptual skills: A South African remedial primary school perspective. *South African Journal of Occupational Therapy, 40*(3), 9-16.

Salem State University. (2021, September 24). *Internal grants*.

<https://www.salemstate.edu/academics/research-hub/support-faculty-research/funding/internal-grants>

Scheiman, M. (2002). *Understanding and managing vision deficits: A guide for occupational therapists*. (2nd ed.). Slack, Inc.

- Schmetz, E., Rousselle, L., Ballaz, C., Detraux, J. J., & Barisnikov, K. (2018). The BEVPS: A new test battery to assess visual perceptual and spatial processing abilities in 5-14 year-old children. *Applied Neuropsychology: Child*, 7(4), 317-333.
<https://doi.org/10.1080/21622965.2017.1336710>
- Schneck, C. (2019). Best practices in visual perception and visual-motor skills to enhance participation. In G. Frolek Clark, J. E. Rioux, & B. E. Chandler (Eds.), *Best practices for occupational therapy in schools* (2nd ed., pp. 489-496). Bethesda, MD: AOTA Press. <https://doi.org/10.7139/2019.978-1-56900-591-0.058>
- Smith, R., Ralston, N. C., Naegle, Z., & Waggoner, J. (2020). Team teaching and learning: A model of effective professional development for teachers. *The Professional Educator*, 43(1), 80-90.
- Stoneham Public Schools. (2018-2021). *Collective bargaining agreement: Stoneham school committee and Stoneham teachers' union*.
<https://stonehamteachers.files.wordpress.com/2018/11/sta-contract-2018-2021.pdf>
- Strong, S., Rigby, P., Stewart, D., Law, M., Letts, L., & Cooper, B. (1999). Application of the person-environment occupation model: A practical tool. *Canadian Occupational Therapy Journal*, 66(3), 122-133.
<https://doi.org/10.1177/000841749906600304>
- Sullivan, C., Lynch, H., & Kirby, A. (2018). Does visual perceptual testing correlate with caregiver and teacher reported functional visual skill difficulties in school-aged children? Considerations for practice. *Irish Journal of Occupational Therapy*, 46(2), 89-105. <https://doi.org/10.1108/IJOT-03-2018-0005>

- Tarnow, K., Gambino, M. L., & Ford, D. J. (2013). Effect of continuing education: Do attendees implement the tools that are taught? *The Journal of Continuing Education in Nursing*, 44(9), 391-396. <https://doi.org/10.3928/00220124-20130701-68>
- Therapy Fun Zone. (n. d.). Visual perceptual skills.
<https://therapyfunzone.net/blog/ot/visual-perceptual-skills>
- Tools to Grow. (2016). Tools to grow: What to know and how to develop visual perceptual skills preschool through school age children.
<https://www.toolstogrowot.com/>
- Trivette, C. M., Raab, M., & Dunst, C. J. (2012). An evidenced-based approach to professional development in Head Start classrooms. *NHSA Dialog: A Research-to-Practice Journal for the Early Childhood Field*, 15(1), 41-58.
<https://doi.org/10.1080/15240754.2011.636489>
- Tseng, M. H., & Chow, S. M. K. (2000). Perceptual-motor function of school-age children with slow handwriting speed. *American Journal of Occupational Therapy*, 54(1), 83-88. <https://doi.org/10.5014/ajot.54.1.83>
- United States Department of Education. (2010). *Free Appropriate Public Education for Students with Disabilities: Requirements Under Section 504 of the Rehabilitation Act of 1973*. <https://www2.ed.gov/about/offices/list/ocr/docs/edlite-FAPE504.html>
- Vanslambrouck, S., Zhu, C., Pynoo, B., Thomas, V., & Lombaerts, T. (2018). An in-depth analysis of adult students in blended environments: Do they regulate their learning in an ‘old school way? *Computers & Education*, 128, 75-87.
<https://doi.org/10.1016/j.compedu.2018.09.008>

- Vaughan, K. T. (2020). Evaluating the single service point using the person-environment occupation model. *Libraries and the Academy*, 20,(2), 361-379.
<https://doi.org/10.1353/pla.2020.0018>
- Vlok, E. D., Smit, N. E., & Bester, J. (2011). A developmental approach: A framework for the development of an integrated visual perceptual programme. *South African Journal of Occupational Therapy*, 41(3), 25-33.
- Williams, C., Northstone, K., Sabates, R., Feinstein, L., Emond, A., & Dutton, G. N. (2011). Visual perceptual difficulties and under-achievement at school in a large community-based sample of children. *PLoS ONE*, 6(3), 1-9.
<https://doi.org/10.1371/journal.pone.0014772>
- World Federation of Occupational Therapists. (2012). *Definition of occupation*.
<https://www.wfot.org>
- Wuang, Y. P., Chiu, Y. H., Chen, Y. J., Chen, C. P., Wang, C. C., Huang, C. L., Wu, T. M., & Ho, W. H. (2018). Game-based auxiliary training system for improving visual perceptual dysfunction in children with developmental disabilities: A proposed design and evaluation. *Computers & Education*, 124, 27-36.
<https://doi.org/10.1016/j.compedu.2018.05.008>

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