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Occupational Therapy in the Snoezelen® Room: Teachers' and Therapists' Knowledge and Perceptions

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OCCUPATIONAL THERAPY IN THE SNOEZELEN® ROOM: TEACHERS' AND THERAPISTS' KNOWLEDGE AND PERCEPTIONS

Mika Solomon

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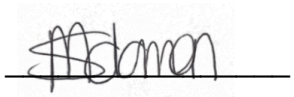
A Research Report submitted to the Faculty of Health Sciences, School of Therapeutic Sciences, University of Witwatersrand, Johannesburg in fulfilment of the requirements for the degree of Masters of Science in Occupational Therapy.

Johannesburg

23 August 2024

Declaration

I, Mika Solomon, declare that this Research Report is my own, unaided work. It is being submitted for the Master of Science in Occupational Therapy at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

Mika Solomon — 

Name of candidate — Signature of candidate

23rd day of August 2024 in Johannesburg, South Africa

Abstract

Introduction: The Snoezelen® room, which is a multisensory environment, is often used in conjunction with sensory integrative techniques. Many children who experience learning difficulties also have difficulty with sensory integration. Therefore, it can be deduced that the Snoezelen® room may be of great support in the treatment of sensory integration difficulties within occupational therapy sessions. Research has documented positive outcomes of children's performance in the multisensory environment. However, little research has suggested the notion of skills being carried over from the multisensory environment into the classroom or home environments.

Aim: The aim of this research was to investigate teachers' and therapists' knowledge and perception of the changes in children's performance following occupational therapy in the Snoezelen® room.

Method: A quantitative descriptive cross-sectional survey design was used for the study. It was completed in two specialised school environments, whereby a purposive sampling was used to select teachers and therapists who have worked with children who receive occupational therapy intervention in the Snoezelen® room. Once ethical clearance was received, data were collected using a survey created for the purpose of this research study.

Results: Teachers and therapists with diverse professional experience had good prior knowledge that aligns with the principles and recommendations commonly found in MSE research. Strong positive and significant correlations were found between the total impact of the Snoezelen® room and the level of arousal of the children, as well as their behaviour and their scholastic performance. Participants ranked the biggest change following occupational therapy in the Snoezelen® room as improvement in a child's level of arousal, which appeared to be 'just right' for hours upon returning to the classroom.

Conclusion: It is beneficial for schools to have a Snoezelen® room. Sensory input did cause change in a child's level of arousal, which is then transferred to an external environment such as the classroom. Most teachers and therapists perceive that the Snoezelen® room positively changed behaviour and scholastic performance, through improving level of arousal. Thus, the acquisition of self-regulation skills lays the foundation for positive classroom behaviour and academic performance.

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List of Abbreviations

OT	Occupational Therapy
MSE	Multisensory Environment
SIT	Sensory Integration Therapy
ASI	Ayres Sensory Integration®
CoO	Categories of Occupation
ADHD	Attention Deficit Hyperactivity Disorder
ASD	Autism Spectrum Disorder
REDcap	Research Electronic Data Capture Platform
SPD	Sensory Processing Disorder
DESB	Duvereux Elementary School Behaviour Rating Scale
CNS	Central Nervous System
SEN	Special Educational Needs
FOS	Foundation Outcome Statement Skills

Nomenclature

Multisensory environment	“Rooms or spaces containing equipment that is designed to provide sensory stimulation to the users. Ideally, the sensory experiences provided are tailored to the perceived needs of the user” (Stephenson and Carter, 2011a, p. 276).
Activities	“Actions designed and selected to support the development of performance skills and performance patterns to enhance occupational engagement” (Occupational Therapy Association, 2020, p. 74).
Occupations	“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” (Occupational Therapy Association, 2020, p. 7)
Learning Disability	“Unexpected, significant difficulties in academic achievement and related areas of learning and behaviour” (Cortiella and Horowitz, 2014a, p. 3).
Intellectual Disability	ID occurs during the child's development period (until the age of 18) before the school period and is characterized by deficits in general mental abilities (reasoning, problem solving, abstract thinking, school learning, learning from experience) (Silvia Alexandrina, Cristian and Stan, 2021).
Adaptive Response	“Successful interactions with the environment in response to environmental demand, can be seen as the building blocks for successful engagement and participation in occupational roles” (Lane and Schaaf, 2010, p. 376).
Ayres Sensory Integration®	“The neurological process that organizes sensation from one’s own body and from the environment and makes it possible to use the body effectively within the environment” (Beyer et al., 2019, p. 1).

Sensory processing	“The way the body receives, analyzes, and responds to the signals it receives from its environment” (Beyer et al., 2019).
Sensory modulation	Sensory modulation is associated with the brains ability to regulate itself in terms of emotional regulation, attention, and level of arousal (Stock Kranowitz, 2022).
Sensory discrimination	A deficiency in the ability to discriminate sensations in any sensory system, or across sensory systems, in a way that impairs occupational performance (Bundy and Lane, 2020).
Self-regulation	Self-regulation is an umbrella term that refers to skills such as inhibitory control, working memory, sustained attention, and persistence, which are essential for adapting to a formal school environment (Farran and Jo Wilson, 2014).
Emotional regulation	Emotional regulation relates to actions or behaviors we use to identify, manage, and express feelings while engaging in activities or interacting with others (Blackwell et al., 2014).

Chapter 1 Introduction, Literature Review, And Methods

1.1 Introduction

1.1.1 Introduction to the study

The Snoezelen® room was initially developed between the 1970s to 1980s by therapists who worked in an establishment for people with intellectual disabilities (Novakovic et al., 2019). Snoezelen® is the trademark name for a specific type of multisensory environment (MSE). A Snoezelen® environment can be described as a safe and non-threatening room where individuals are encouraged to explore the equipment in the environment. This is done to stimulate senses of hearing, vision, and touch, as well as vestibular and proprioceptive sensation (Botts, Hershfeldt and Christensen-Sandfort, 2008a). As such, the concept of Snoezelen® rooms was introduced in the form of a specifically designed room to encourage exploration of the quantity, nature, intensity, and arrangement of sensory stimuli (Nasser et al., 2004a). The nature of Snoezelen® thus inherently allows for client-centred care. Initially, the sole purpose of Snoezelen® was to provide relaxation and leisure time (Novakovic et al., 2019). The focus later shifted and there was enhanced attention towards making use of Snoezelen® as a treatment for more serious difficulties, such as brain injury and dementia, but recently there has been discussion about the use of Snoezelen® within schools. Many professionals, including occupational therapists, who provide intervention within the Snoezelen® room have chosen to make use of it in such a way that additional educational and therapeutic aims can be met (Hogg et al., 2001a). For example, when a child is more regulated and focused within this controlled and non-distracting environment, occupational therapy aims such as handwriting or speech therapy aims such as turn taking can be more easily met. Occupational therapists also use the Snoezelen® room in conjunction with Ayres Sensory Integration® (ASI), which ensures controlled sensory stimulation (Roley et al., 2007a). There has been research by authors such as Shapiro *et al. (2009),* and Stephenson and Carter (2011), documenting positive outcomes of behaviour due to the multisensory environment. Examples of positive outcomes include behavioural enhancement, reduced levels of pain, a balance of heart rate, calming effects, and increased motivation (Shapiro et al., 2009a; Stephenson and Carter, 2011a). In a study completed by Stephenson and Carter (2021), teachers' perceptions of the use of MSEs in schools were explored. Many teachers affirmed that MSEs allow children to receive an opportunity to focus on specific tasks, while being free of distraction. However, not many teachers suggested the notion of skills being carried over from the MSE into the classroom environment or

other environments like the home (Stephenson and Carter, 2011a). Thus, there is limited evidence that changes in children's behaviour and performance observed within the Snoezelen® room are transferred to the classroom or school environment.

1.1.2 Problem Statement

Although there is an indication that children's behaviour might change positively during occupational therapy intervention while they are in a multisensory environment (MSE), there seems to be a lack of evidence that these positive changes continue when the child returns to external environments, such as the classroom or school environment (Stephenson and Carter, 2011a). Thus, there is a need to explore teachers' and therapists' perceptions of the changes that can be observed in classrooms and school environments, after occupational therapy intervention is administered within the MSE, to clarify its impact (Stephenson and Carter, 2011a).

1.1.3 Purpose of the study

The purpose of this study was to explore the transfer of positive changes from the MSE to the classroom or school environment to validate the benefit of having a MSE within school environments.

1.1.4 Research Question

How do teachers and therapists perceive the aftereffects of occupational therapy within the Snoezelen® room, related to children's level of arousal, behaviour and scholastic performance, in a specialised school environment?

1.1.5 Aim of the study

The aim of this study was to investigate the knowledge and perception of teachers and therapists about the changes in children's behaviour and classroom performance following treatment in the Snoezelen® room, as an occupational therapy modality in a specialised school environment.

1.1.6 Objectives of the study

The objectives of this study were to determine:

- Teachers' and therapists' knowledge of the Snoezelen® room.
- Teachers' and therapists' perceptions of the impact of occupational therapy in the Snoezelen® room with respect to changes in children's level of arousal carried over to the classroom/therapy environment.

- Teachers' and therapists' perceptions of the impact of occupational therapy in the Snoezelen® room with respect to changes in children's behaviour carried over into the classroom/therapy environment.
- Teachers' and therapists' perceptions of the impact of occupational therapy in the Snoezelen® room with respect to changes in children's scholastic performance in the classroom/therapy environment.

1.1.7 Justification of the study

The decision to carry out this study arose from the need to understand the changes in children's behaviour and performance within the broader school context as a result of occupational therapy in the MSE. With the increasing use of Snoezelen® rooms in conjunction with the achievement of occupational therapy aims, understanding to what extent the positive changes observed within the controlled MSE environment translate into benefits in the external school environment, is important.

1.2 Literature Review

This literature review explores the connection between the occupational therapy profession and the use of Snoezelen®. This will include an overview of occupational therapy intervention within specialised schools, the history and use of Snoezelen® rooms, the outcomes of occupational therapy that takes place in these rooms, as well as the research gap surrounding the positive changes seen regarding concepts for children in specialised school environments.

The literature explored for this study was retrieved from multiple sources and predominantly originated from research articles. The databases used to access these articles primarily included Google Scholar, ScienceDirect, ProQuest, Taylor & Francis, JSTOR and PubMed.

1.2.1 Learning difficulties in children

Occupational therapists commonly work in specialised schools or other schools where children may experience learning difficulties. Learning disabilities can be best described as "unexpected, significant difficulties in academic achievement and related areas of learning and behaviour" (Cortiella and Horowitz, 2014a, p. 3). For a child who has minor learning disabilities, initial signs of difficulty may only appear at a school going age when his or her performance does not meet the teacher's expectations (O-Brian and Kuhaneck, 2020). These difficulties arise from differences in the neurological structure of the brain and its' function which impacts one's ability to store, receive and

process incoming information (Cortiella and Horowitz, 2014a). Therapy and intervention may result in modification of the gene sequences, however, cannot ultimately change the genetics a child inherits at birth. Therefore, throughout schooling and into adulthood, children with learning difficulties may need to exert more effort to achieve the same results as their peers, which can cause anxiety or frustration (Berninger and May, 2011). Many children who have learning disabilities have complications with sensory integration, which can be the cause of some or all of their learning difficulties (Stonefelt and Stein, 1998). Therefore, early recognition and intervention for children who show probability of a learning disability is beneficial. This allows for appropriate services and support to be arranged, and accommodations to be made to assist them in overcoming obstructions to learning and ultimately to grow into independent members of society (Cortiella and Horowitz, 2014a). This corresponds to the role of an occupational therapist, as mentioned above.

It is well researched that children with learning disabilities are often seen as insufficient learners due to their disorganisation, poor use of effective learning strategies, and their poor ability to independently problem solve (Watson, Gable and Morin, 2016). They also have difficulty self-regulating to prioritise, organise, and sort information that is relevant to the classroom (Watson, Gable and Morin, 2016). These signs are often identified by the teacher in the classroom and therefore difficulties related to their scholastic performance are frequently noted first. Skills such as reading, writing, and mathematics, which are commonly referred to as 'academic' skills, can be affected (Stonefelt and Stein, 1998). Due to difficulties with reading and writing tasks, children's knowledge can be poorly reflected in their academic performance (Watson, Gable and Morin, 2016). Other skills, such as cognitive skills, become difficult for children with learning disabilities. According to the fourth edition of the occupational therapy practice framework, specific mental functions, or cognitive functions, include higher-level cognitive skills, as well as attention, memory, perception, and thought (American Occupational Therapy Association, 2014). Executive functioning skills are higher-order cognitive skills that are not fully developed until one is in the mid-20s. These refer to the group of top-down mental processes that make it possible for several cognitive skills to work together to solve intricate problem-solving tasks (Diamond, 2020). Examples of executive functions include planning, problem solving, organisation, time management, work pace, and initiation and completion of tasks (Paul, 2013). Children with learning disabilities must exert more effort to achieve the same results as their

peers, due to these difficulties with cognitive, academic, or social functioning (Watson, Gable and Morin, 2016). Therefore, they can also present with anxiety and behavioural changes that can further affect their participation in the classroom (Berninger and May, 2011). One of the suitable and researched instruments to assess the classroom behaviour of primary school children is the Duvereux Elementary School Behaviour Rating Scale (DESB) (Spivack and Swift, 1967; Reynolds and Bernstein, 1982). This was created to measure behaviours that could improve or stunt student academic performance. The factors that are explored in this assessment include: classroom disturbance, irrelevant-responsiveness, disrespect-defiance, impatience, external blame, achievement anxiety, inattentive-withdrawn, external reliance, comprehension, creative initiative, and need closeness to teacher (Reynolds and Bernstein, 1982). Reynolds and Bernstein (1982) determined that the DESB reliably assesses classroom behaviour of primary school children. As children with learning disabilities have several areas in which they experience difficulties, the broad areas of level of arousal, behaviour, and scholastic performance should be thoroughly examined to assist in early identification of learning disabilities and improve their participation within the classroom (Stonefelt and Stein, 1998).

1.2.2 Occupational therapy in specialised school environments

Historically, an inclusive or specialised school programme was only considered if a child was not expected to keep up with educational demands. Today, inclusion in schools has become a popular topic, demonstrating that children with or without disabilities have the right to proper education in the least restrictive environments possible (Bolourian, Tipton-Fisler and Yassine, 2020). However, specialised school environments are still available for children who require adaptations to enhance their learning, particularly in South Africa. This can include smaller classes, remedial support, therapy support, and slower pace of curriculum. Occupational therapists are often found in specialised school environments, as a key role of theirs is to support the functioning of children within the education setting. Occupational therapists are commonly seen as handwriting specialists when it comes to school-based intervention, and children are frequently referred to occupational therapists for fine motor difficulties (Bolton and Plattner, 2019). However, occupational therapists have a much broader scope of practice when working in specialised school environments. Occupational therapists collaborate with caregivers to achieve children's maximum participation in daily activities or occupations. The aim of this therapy is to ensure an optimal student-environment fit (Sonday et al., 2012). Children derive meaning from their occupations

as they are formed in relation to social and cultural expectations from peers (Clark, Jackson and Polichino, 2011). In specialised school environments, occupational therapists assist children with challenges to participate optimally in activities expected of them within their natural environment. These occupations are broadly divided into categories of occupation (CoO) including social participation, education, leisure, play, and rest and sleep (Clark, Jackson and Polichino, 2011; Occupational Therapy Association, 2020). An important CoO to highlight further is that of education, particularly in relation to children of school-going age. Occupational therapists carry out assessments to identify scholastic difficulties and whether the child can meet school demands compared to his/her peers. All areas that impact the participation of a child in school, such as academic activities, non-academic activities, extracurricular activities, and prevocational activities can be assessed (Bolton and Plattner, 2019). Collaboration with relevant members of the team, including caregivers, teachers, or other therapists of the child is part of the process. Following assessment and collaboration with relevant team members, occupational therapists can find solutions that help remove any barriers the child might experience in learning. This may include adapting their environment to afford their learning (O'Donoghue, O'Leary and Lynch, 2021). The benefits of a pull-out approach in which children are seen in separate smaller therapy rooms for one-to-one occupational therapy have been identified (O'Donoghue, O'Leary and Lynch, 2021). In this way, the children receive an intervention that is specifically tailored to meet their needs. On the other hand, occupational therapists working in the classroom have been suggested to show great advantages related to collaboration with the teacher, as well as allowing the child to participate in their natural learning environment (O'Donoghue, O'Leary and Lynch, 2021). In this way, teachers can be coached and therefore become empowered to implement occupational therapy strategies in the classroom (Bolton and Plattner, 2019). School-based occupational therapists are able to assist children who have sensory integration, learning, behavioural, or social challenges, which goes hand in hand with their specialised purpose of maximising children's overall engagement in their daily occupations (Villasenor, Smith and Jewell, 2018). Additionally, a common frame of reference used in school-based occupational therapy is sensory integration therapy.

1.2.3 Sensory integration

Jean Ayres was a neuropsychologist and occupational therapist whose career involved learning about and determining how to treat children with behavioural and learning

difficulties (Lane et al., 2019). She introduced the idea that children with learning difficulties may also experience neurological dysfunction with respect to their ability to process sensory information (Leong, Carter and Stephenson, 2015a). Thus, to address this dysfunction, Ayres developed a method of intervention called Ayres Sensory Integration® (ASI), which ensures that controlled sensory stimulation is provided (Roley et al., 2007a). She described sensory integration as "the neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment" (Bundy and Lane, 2020, p. 4). This theory describes how the nervous system receives sensory input and translates it to allow for an appropriate adaptive behavioural outcome (Lane et al., 2019). It aims to promote improvement of higher-order skills such as language, academic skills, motor skills, and behaviour (Leong, Carter and Stephenson, 2015a). These skills have been shown to be related to the neurological pathways in the brain that are responsible for integrating sensory information. It is important to note that ASI therapy needs to adhere to the principles of the theory and meet certain criteria as indicated in a fidelity measure, such as presenting sensory opportunities, allowing choice in the activity and supports the child's intrinsic motivation, to name a few (Parham et al., 2011). Thus, not all sensory therapy is regarded as ASI. Snoezelen®, which will later be discussed, is not considered as pure ASI therapy, and will therefore be referred to as a form of sensory integration therapy (SIT), as will further discussion related to treatment using sensory modalities (Parham et al., 2011). The main goal of SIT is to change the way the brain modulates and organises incoming sensory information. The function of the nervous system is optimal when information from the proprioceptive system, vestibular system, and tactile system is combined and processed efficiently. Therefore, all sensory systems work together to allow optimal functional output (Beyer et al., 2019). The vestibular system is an important area to consider when using SIT intervention. The vestibular system is made up of two different kinds of receptors. The semicircular canals detect rotational or angular movement, and the otolith organs detect linear movement (Lane et al., 2019). Thus, the vestibular system plays a vital role in providing the body with information about movement, continuously operating to allow unconscious fluid movement in relation to gravity. In the 1960s, researchers discovered cortical areas that receive information from vestibular projections. It was then confirmed that information from the vestibular system moves along different pathways to the brain, contributing to smooth movements, as well as other critical body functions (Lane *et al.*, 2019). These include

postural control, equilibrium reactions, bilateral coordination, visual control, spatial perception, and arousal and emotional regulation. Therefore, Ayres theorised that difficulties with vestibular processing can negatively impact higher-order cognitive functions, such as executive functions, that allow for successful learning and academics, as well as the level of arousal needed for emotional regulation and self-regulation (Lane *et al.*, 2019).

Furthermore, touch is the most primitive sense, as it is the first sense that allows contact with the world prior to the development of language, cognitive, and motor skills (Bundy and Lane, 2020). Tactile information has also been shown to travel to areas of the brain that impact emotional regulation, arousal, and autonomic regulation. Proprioceptive information is combined with tactile information to help identify where your body is in space and to make appropriate adaptations in motor output to meet the demands of the environment. Thus, proprioceptive, tactile, and vestibular input is said to jointly contribute to the development of body awareness, the perception of movement, and the development of praxis and coordination. These areas of development are vital to enhance a child's participation in education. For example, the vestibular and proprioceptive systems support the postural ability to sit upright at a table in the classroom, highlighting the importance of postural control for academic and motor performance. Another example posits that the combination of sensory stimulation provides input necessary for the development of reading and writing, and thus children with impaired sensory integration may also display learning difficulties (Roley *et al.*, 2007a).

Treatment through SIT intends to offer the child multiple sensory inputs. The aim is to meet the 'just right challenge', which dictates that the activity is at the correct level for the child. Thus, the activity provides the correct level of challenge while still allowing the child to succeed and create an adaptive response (Pollock, 2009). The activity should be child-led to allow for the child to show motivation and actively engage in the activity, making play a vital part of this type of intervention. Young children respond well to SIT because their brains are still mouldable; in other words, there is still an opportunity for neuroplasticity. This alludes to the fact that brain function is not permanent and can be changed. As children grow, the less mouldable the brain becomes. Recent evidence suggests that changes in brain structure due to neuroplasticity have been observed as soon as three to five months of age, with the

highest maturation in the first 8 years of life (Bundy & Lane, 2020). Therefore, it may be beneficial to address difficulties via occupational therapy intervention at a younger age, as therapy aims can be more readily met in younger children whose brains can still adapt due to neuroplasticity (Leong, Carter and Stephenson, 2015a).

1.2.4 Sensory integration difficulties in children with learning difficulties

Children with sensory integration challenges are likely to experience difficulties participating in their education occupation (Villasenor, Smith and Jewell, 2018). Thus, sensory integration difficulties are prevalent among children in specialised schools, particularly those who are diagnosed with Autism Spectrum Disorder (ASD), attention deficit hyperactivity disorder (ADHD), or additional learning difficulties (Lane *et al.*, 2019). If an individual has difficulty taking in information from his/her surroundings and integrating it within his/her central nervous system (CNS), he/she will have trouble responding appropriately regarding planning and organising his/her behaviour (Beyer *et al.*, 2019). Multiple educational activities such as classroom work, playing outside, eating lunch at break time, or physical education, require children to integrate different kinds of sensory input. The abundance of sensory stimuli found in a typical schooling environment can be overwhelming for certain children (Villasenor et al., 2018). This could explain why some children have difficulties regulating themselves, keeping attention, engaging in social scenarios, participating in school activities, and most importantly learning new skills (Pollock, 2009). Learning is a broad term. This alludes to the adaptive responsive approach by which a child is able to change their behaviour to meet a certain expectation. This also alludes to motor learning whereby a child develops increasingly difficult motor skills, such as learning to write with a pencil after being able to colour in with a crayon. Lastly, learning also alludes to academic or cognitive learning (Stock Kranowitz, 2022). Thus, there are many aspects that contribute to sensory integration and where sensory integration of a child could be impacted or impact other areas of function. Sensory integrative dysfunction can be divided into two types: poor sensory modulation and sensory discrimination. While sensory discrimination involves praxis that contributes to action, sensory modulation provides more of a regulatory function (Bundy and Lane, 2020). Sensory modulation is associated with the brains ability to regulate itself in terms of emotional regulation, attention, and level of arousal. Therefore, difficulties are observed when a child cannot modulate or synchronise sensations successfully (Stock Kranowitz, 2022). Difficulty adapting responses to sensations is displayed when the level of arousal of a child is not optimal; in other words, they have difficulty self-regulating. A child might adapt one

day and not adapt the next, depending on the sensory input one receives throughout the day and their ability to adapt in that moment (Stock Kranowitz, 2022). Successful adaptation and regulation following sensory input are signs of good sensory modulation. On the other hand, children who have sensory discrimination difficulties have difficulty planning new body movements, due to difficulties with body scheme. This is because the CNS wrongly processes vestibular, tactile, or proprioceptive inputs, so the child does not have clear information to use to make adaptive responses to function throughout the day (Bundy and Lane, 2020; Stock Kranowitz, 2022). These difficulties translate into signs of clumsiness, difficulty judging force, and difficulty planning body movements.

1.2.5 Sensory-based interventions

There are three categories of intervention that stem from a sensory integration approach to assist children who have difficulty processing sensory information. These include adaptation of the child's environment, caregiver-based interventions with teachers and parents, and child-based interventions (Beyer *et al.*, 2019). Factors in a child's environment can prevent participation due to imbalanced sensory input and therefore can be improved by enhancing sensory input. For example, seating adaptations, such as cushions, weighted blankets, or headphones, can allow enhanced processing of sensory input in one's surroundings (Beyer *et al.*, 2019). Regarding caregiver-based interventions, coaching caregivers and supporting a child in their natural environment allows the intervention to highlight the strengths of families and thus supports the treatment goals (Beyer *et al.*, 2019). Lastly, child-focused interventions work to give the child an individualised combination of sensory feedback to promote skills that will improve their participation in daily activities (Beyer *et al.*, 2019). May-Benson and Koomar (2010) carried out a systematic review in which 27 studies were investigated to determine the efficacy of the sensory integration approach (May-Benson and Koomar, 2010a). The findings suggested that SIT can improve outcomes in areas such as reading and writing, sensory-motor functions, motor planning, regulation of behaviour, attention, and socialisation (Schaaf *et al.*, 2018). Evidently, there is much research that suggests the benefits of multisensory exposure in facilitating learning in both atypically and typically developing children. However, there is limited research exploring the educational benefits of using multisensory stimulation within a school context (Broadbent *et al.*, 2018). This statement is particularly related to the development of children's executive functioning skills.

Cognitive and behavioural benefits have been observed in research following a child's receipt of multisensory input compared to unisensory input. However, the senses do not interact in a homogeneous way throughout development, and therefore sensory challenges are most frequently observed among school-going children (Broadbent *et al.*, 2018).

1.2.6 Level of arousal

Dunn developed a sensory-based model that explains the association between self-regulation strategies and neurological operations and thus builds on findings of ASI (Nesayan *et al.*, 2018). Dunn's model explains neurological thresholds and how different thresholds impact self-regulation (Dunn, 2008; Blackwell *et al.*, 2014). Each person processes sensation throughout the day; however, each person processes that sensory information differently. There is a continuum that explains how people respond to sensations according to four different types of thresholds, including poor registration, sensation seeking, sensation avoiding, and sensory sensitivity (Bundy and Lane, 2020). Self-regulation refers to the strategies a person uses to manage their own thresholds or level of arousal. For example, a child who is often on the go and has a high level of activity is likely to have a high threshold for vestibular input, or movement. Therefore, this child would have a high level of arousal. This may cause the child to be disruptive to others or to themselves. Occupational therapists help children, and their caregivers understand their thresholds and use sensory strategies to increase their engagement and learning (Blackwell *et al.*, 2014). One common approach to implement these strategies is the Alert Programme (Williams and Shellenberger, 1996). This programme uses appropriate classroom activities and vocabulary to teach children strategies for self-regulation (Blackwell *et al.*, 2014). The following analogy is used to teach children about self-regulation: “If your body is like a car engine, sometimes it runs on high, sometimes it runs on low, and sometimes it runs just right” (Williams and Shellenberger, 1996, p. 2). In this way, children learn to identify the speed at which their body or ‘engine’ is running, as well as activities that help change the speed of their engine. For example, if a child’s engine is running high, this means that they are at a high level of arousal and are seeking additional sensory input to assist them regulate. They may require additional vestibular or proprioceptive input to change the speed of their engine to ‘just right’ (Blackwell *et al.*, 2014). Swinging in a linear motion, for example, provides regulating vestibular input. Ultimately, children learn to recognise, change, and maintain their level of arousal to increase their participation in the classroom. Researchers argue that the improvement of self-

regulation is vital for younger children, as this lays the grounds for early childhood learning and intersects with all aspects of behaviour and performance output (McClelland *et al.*, 2007; Blackwell *et al.*, 2014). Children who can self-regulate have a higher chance of remaining focused, taking turns and following instructions, and are less likely to show impulsivity or aggressive behaviour (McClelland *et al.*, 2007). There is evidence that Snoezelen® can affect one's level of arousal, particularly related to changing levels of relaxation, emotion, and well-being through the provision of the correct amount of sensory input (Hogg *et al.*, 2001a).

1.2.7 History and use of the Snoezelen® room

The concept of the multisensory environment (MSE) was brought about in 1987 by two scientists, Hulsegge and Verheul, in the Netherlands, with their original purpose being relaxation and leisure exploration for people with profound intellectual disabilities (Kwok, To and Sung, 2003; Grace, 2020). A company named Rompa later trademarked Snoezelen®, a specific type of MSE. Snoezelen® agrees with the history of sensory modalities being the focus when individuals with intellectual disabilities are receiving treatment. Many pioneers such as Jean-Marc-Gaspard Itard and Edouard Seguin incorporated sensory modalities into their teachings. Maria Montessori also highlighted the principle that development occurs through spontaneity and is best achieved in a sensory-controlled environment (Hogg *et al.*, 2001a). Thus, Snoezelen® emerged as the next logical development of sensory approaches. Although the concept was first derived as a relaxation method, it was soon discovered that the use of these rooms had other positive therapeutic effects, such as minimisation of challenging behaviour, and providing an opportunity for social interaction (Pagliano, 1998). Subsequently, MSEs were built in hospitals, daycares, and specialised schools (Kwok, To and Sung, 2003). The word Snoezelen® itself carries meaning from a combination of two words, namely snuffelen, which is 'sniff', and doezelen, which is ‘doze’ (Kwok, To and Sung, 2003). The word ‘sniff’ alludes to the English meaning ‘to sniff out’, in other words, to find something by exploring the situation (Hogg *et al.*, 2001a). These words refer to the exploration of an environment that allows relaxation paired with a pleasurable sensory aspect (Lotan and Gold, 2009a). As such, the concept of Snoezelen® was introduced in the form of a specifically designed room that encourages exploration of the quantity, nature, intensity, and arrangement of sensory stimuli (Nasser *et al.*, 2004a). These are explored within its safe and relaxing environment that reduces the notion of external emotional or physical pressure that might be experienced in other demanding environments (Botts, Hershfeldt and

Christensen-Sandfort, 2008a). Thus, making this room more inviting to an individual who experiences sensory overload, or hyper-reactivity, such as a child who might have an adverse response to sensory stimuli and thus be overwhelmed in a busy classroom environment (Long and Haig, 1992). Although there is no set standard for the equipment found in the Snoezelen® room, most include components of each sensory modality. Equipment that is often present can include white-coloured equipment, seating and walls that are soft and padded, mirror balls, bubble tubes, coloured lights, a projector, lava lamps, music, and colour-changing fibre-optic cables, all of which can be controlled by the individual to meet their sensory needs (Shapiro *et al.*, 2009a; Challis, Hildred and Bailey, 2020).

Research conducted by Pagliano in 1998 found that MSE are beneficial in improving the following areas: Opportunity for emotional development, improvement of communication, stimulation of all senses, relaxation, facilitation of therapy, development of self-confidence, minimisation of challenging behaviour, and providing an opportunity for social interaction (Pagliano, 1998). Kwok et al. in 2003 also found that the above-mentioned are benefits of the MSE with the following areas as additions: Achieve a sense of control, provide leisure and enjoyment, promote choice, encourage exploration and creative activities, establish rapport with care givers, and improve attention span (Kwok, To and Sung, 2003). The Snoezelen® room evidently has many benefits, particularly noted while inside the room.

1.2.8 Snoezelen® in school environments

The Department of Education in England highlighted the necessity of multisensory rooms for children with learning disabilities, as current research has found that having a dark, activity associated space that is free from interruptions is beneficial (Grace, 2020). As usage of MSEs increases internationally, their use in schools is increasing in popularity. They are common in the intervention with children with ASD; however, more evidence-based research is needed to validate their use (Unwin, Powell and Jones, 2022). In the literature from the early 2000s, there were some reports of the positive outcomes seen while children were in the Snoezelen® room, such as improved social interaction and maladaptive behaviours (Shapiro *et al.*, 1997a; Singh *et al.*, 2004). Additionally, positive effects of multisensory stimulation, such as reduced anxiety or increased relaxation, were mostly limited to the activities in the Snoezelen®

room with little carry-over or transfer of these positive outcomes to other environments (Toro, 2019).

Although Snoezelen® is a trademarked concept, the concept of sensory environments has slowly taken on the widely used term multisensory environment (MSE) (Challis, Hildred and Bailey, 2020). Research that focusses on MSEs in school settings includes work by deBunsen (1994), Hepworth (1993), and Pagliano (1995), which showed positive impacts associated with MSEs, such as those mentioned above. However, these studies did not show effectiveness measures and had small sample sizes (Houghton *et al.*, 1998). These studies also date back more than 10 years and, thus, should be revalued by newer research. In a study by Pagliano (1998), seven teachers and two therapists were interviewed and reported positive findings about MSEs. However, he highlighted that this research was preliminary, and that further research was necessary (Houghton *et al.*, 1998; Pagliano, 1998). Thus, Houghton et al. (1998) conducted a follow-up study. Seventeen students with severe disabilities attending a specialised school underwent assessment using the Foundation Outcome Statement Skills (FOS skills) and were seen in MSEs. Data were obtained before and after MSE usage. Four FOS skills were particularly noted to have improved, including engaging in appropriate eye contact, tracking an object horizontally, tracking vertically, and tracking in a circular motion (Houghton *et al.*, 1998). There was no link to how these skills would benefit children in an educational setting. There have been other and more recent research documenting positive outcomes of behaviour due to the MSE, such as behavioural enhancement, reduced levels of pain, a balance of heart rate, calming effects, and increased motivation and attention (Shapiro *et al.*, 2009a; Stephenson and Carter, 2011a; Breslin *et al.*, 2020). There has also been evidence that the Snoezelen® room can affect a child's level of arousal, which can be depicted in a change in behaviour where there is an increase or decrease in relaxation and emotions (Hogg *et al.*, 2001a). More recently, Botts et al. (2008) conducted a study to delve into these effects, however, only two studies that included children were found (Botts, Hershfeldt and Christensen-Sandfort, 2008a). Chan et al. (2005) found an increase in children's positive emotions following intervention in the Snoezelen® room. However, no change in aggression or adaptive behaviours was found (Chan *et al.*, 2005a). Shapiro et al. (1997) found that a child's behaviour seemed to be more adaptive in the Snoezelen® room in comparison to a playroom (Shapiro *et al.*, 1997a). In a study completed by Stephenson and Carter (2011), teachers' perceptions of the use of the MSE in schools

were explored (Stephenson and Carter, 2011a). This study was carried out because there is not enough research on the outcomes of the Snoezelen® room, especially in relation to children, as can be seen above (Stephenson and Carter, 2011a). Many teachers agreed that the MSE allows children to have the opportunity to focus on specific tasks while being free of distraction. Many educational professionals agreed that MSEs can improve behaviour, leading to better learning opportunities within the controlled environment (Unwin, Powell and Jones, 2022). However, not many teachers suggested the idea of these skills being carried over from the MSE into the classroom environment or other environments such as the home, which is a vital component to explore if MSEs are to become significant in contributing to education (Stephenson and Carter, 2011a). In a recent study by Graham (2019), use of MSEs for students who have disabilities was explored (Graham, 2019; Pierce, 2022). The study determined that teachers reported the greatest improvement in children's focus. Furthermore, 57.5% of teachers reported improved following of instructions, 38.8% found students were better on task, 55% observed fewer negative behaviours, and 27.5% found that students had higher levels of motivation after using the MSE (Graham, 2019). This recent research suggests that improvements that are observed within the MSE can be associated with improved functioning in the classroom. However, more research is required to determine which specific skill improvement is carried over from the MSE to the classroom. This will clarify the benefit of having an MSE in a school environment to positively impact children's learning experiences, particularly children with disabilities (Pierce, 2022).

1.2.9 Occupational Therapy and Snoezelen®

When a child has control of their own environment, they are better able to satisfy their sensory needs (Unwin, Powell and Jones, 2022). This customised sensory experience can be likened to the importance of the customised or client-centred approach used in occupational therapy practice. The nature of the Snoezelen® room inherently allows for client-centred care as it aims to promote an enabling approach where there is a nondirective interaction between the client and therapist (Kwok, To and Sung, 2003). Choice and control are greatly correlated to the well-being of a child. Research by Unwin, Powell and Jones (2022) has shown that when a child simply experiences a sense of self-control over their environment, it can be equally as valuable as the adaptations in behaviour noted within that environment (Unwin, Powell and Jones, 2022). Snoezelen®, being a MSE, is specifically equipped to allow the nature and quantity of stimulation to be controlled by the participant who makes use of the room

(Lotan and Gold, 2009a). Similarly, occupational therapy using an SIT approach aims to be child-directed (Lin *et al.*, 2012a). Therefore, the participant has the choice in the sensory stimulation they receive, be it visual, auditory, or tactile modalities, to impact the outcome of their behaviour. There has been an emergence of the term “the sensory curriculum” which suggests the idea of including multisensory input within educational settings, and thus that can be naturally associated with Snoezelen® (Hogg *et al.*, 2001a). Therefore, the Snoezelen® room is often used in conjunction with sensory integrative techniques used by occupational therapists. Sensory integrative dysfunction can cause hyperactivity, difficulty remaining in one position for long periods of time, reduced ability to concentrate on important stimuli, and increased reactivity to irrelevant stimuli in the environment (Lin *et al.*, 2012a). All of these factors adversely impact a child’s ability to partake in classroom activities. These factors can also be addressed in occupational therapy intervention and are often addressed through the use of sensory integrative techniques. Many children who experience learning difficulties also have difficulty with sensory integration, which few or many of their learning difficulties can be associated with. About 90% of occupational therapists In America who practise in school environments use the principles of SIT in their treatment sessions with children with learning difficulties (May-Benson and Koomar, 2010b). Thus, occupational therapists can make use of the Snoezelen® room to meet therapy aims. An occupational therapist may use the Snoezelen® room to carry out a typical therapy session or to create a multisensory environment that stimulates a child's senses and promotes regulation. By offering various sensory experiences within the room, the therapist can tailor activities to address specific therapy goals or therapy can be child-led. For example, to improve fine motor skills, the therapist might use textured objects or light-up toys in the Snoezelen® room, encouraging the child to manipulate them, which integrates sensory input with motor practice. A child may be more willing to place focus on developing additional and more challenging skills due to feeling more regulated within the room, and due to having limited external distractions. Therefore, it can be deduced that the Snoezelen® room may be of great support in the treatment of sensory integration difficulties within occupational therapy sessions to enhance their participation in the classroom.

1.2.10 Conclusion of literature review

More research is required to determine which specific skill improvement is carried over from the MSE to the external environment, such as the classroom. This will clarify the benefit of having an MSE in a school environment to positively impact children’s

learning experiences, particularly children with disabilities (Pierce, 2022). The broad areas of level of arousal, behaviour, and scholastic performance were explored to assist in reaching this aim (Stonefelt and Stein, 1998).

1.3 Methods

1.3.1 Study Design

This research study was a quantitative descriptive cross-sectional survey design study (Kielhofner, 2006a). Descriptive studies are often used in occupational therapy and can be exploratory in nature as they allow for a better understanding of current concepts, which can then be further examined through more intensive research studies (Kielhofner, 2006a). This type of research makes use of already available information and allows for generation of new understandings through, in this case, a survey. Thus, the study was a quantitative type of research, as it used a survey to collect data in a numerical form. Quantitative methods are useful to obtain more accurate and consistent results. This was done by assigning numbers to variables to quantify a specific characteristic. In this case, numbers were assigned to levels of changes in behaviour (Kielhofner, 2006a). Although it can be difficult to measure people's perceptions due to the fact that they depend on self-reports, it is common to use Likert scales to estimate these concepts, as used in this study. Likert scales are one of the most common psychometric scales for investigating self-reported perceptions within a quantitative study (Ho, 2017). A cross-sectional design was used as it helps to explore the relationship between a health outcome and other variables (Kielhofner, 2006a). In this case, the correlation between occupational therapy intervention within the Snoezelen® room and changes in children's behaviour as well as levels of arousal and scholastic behaviour. This design was beneficial in providing an overview of a certain population (Kielhofner, 2006a). A survey design allowed the researcher to send the survey to participants via the online Research Electronic Data Capture platform (REDcap) to maintain anonymity. The survey design also allowed the researcher to analyse multiple variables using statistical methods such as graphs and tables.

1.3.2 Setting

This study was carried out online. However, the research was based on information participants gained through working in specialised schools, specifically those with Snoezelen® rooms on campus.

1.3.3 Population

Participants included teachers and therapists who work in a specialised private school environments with access to a Snoezelen® room, in Johannesburg, South Africa. Therefore, due to this specific nature of the study, participants were sourced directly from two schools that have a Snoezelen® room on campus. The teachers and therapists had experience in special education. The children referred for occupational therapy in the Snoezelen® room did not meet specific requirements, however, were often referred when therapy goals could not be met during standard occupational therapy sessions.

1.3.4 Participation Selection

This study made use of purposive non-probability sampling as the sample of individuals was specifically chosen. This allowed for collection of only relevant information (Kielhofner, 2006a). In this study, a sample of 30 teachers and therapists who work in specialised primary schools in Johannesburg was used. The G*Power Version 3.1.9.4 statistics software was used to determine the sample size according to the aim of the study and the specificity of the sample. It was determined that enough relevant data was collected once a minimum of 30 participants had completed the survey.

1.3.5 Data collection process

Tool development

There were no previous surveys or instruments developed that could be used to meet the aim of this study. Therefore, a survey was created as a method of data collection (Kielhofner, 2006a). The survey (Appendix A) was developed, based on the current literature, and placed on the REDcap platform. The content validity (Appendix B) of this self-developed survey was determined by a panel of experts, prior to data collection, to determine the appropriateness of the questions. This was done using a content validity measure. This required six professionals in the field of occupational therapy, specifically those who have experience in sensory integration, to answer questions related to the relevance, clarity, simplicity, and ambiguity of the survey. This allowed the researcher to verify the validity of the survey. The experts were able to access the survey as well as the content validity questions via a link to the REDcap platform. The links to both the survey as well as the content validity measure were tested beforehand to confirm usability. The self-developed survey consisted of four sections. It used ‘yes’ and ‘no’ questions and Likert scales to interpret these answers

in terms of percentages based on the numerical value assigned to it. The first section included background information and questions about teachers' and therapists' existing knowledge of the Snoezelen® room. The next three sections expanded on different areas of functioning, namely 'level of arousal', 'behaviour' and 'scholastic performance'. These followed the same set of questions that included a four-point Likert scale, from very little effect to very effective, to measure the impact of the Snoezelen® room in improving a child's performance with respect to their 'level of arousal' (Section B), 'behaviour' (Section C) and 'scholastic performance' (Section D). Three-point Likert scales were used to measure changes in child performance following intervention in the Snoezelen® room (Becomes worse, Stays the same, Improves) as well as the duration (Minutes, Hours, Days) and frequency (Never, Sometimes, Always) of these changes. The outcomes that fell into each category were explored to determine the changes that were observed after intervention in the Snoezelen® room. Comment sections were included to enhance the richness of the data and allow participants to explain their answers. Concluding questions were asked to discover gender-based differences, as well as the participants' view on whether it is beneficial to have a Snoezelen® room on school campuses. The term 'effectiveness' was used in the survey, as a way of describing the impact of occupational therapy in the Snoezelen® room, according to participants' perceptions. This was not an effectiveness study as there was no control group or a direct comparison of active treatments (Sox and Goodman, 2012). Rather, this study gained an understanding of the impact according to participants' perceptions.

Data Collection

Data collection began only once ethics clearance from the Human Research Ethics Committee (Medical) of the University of the Witwatersrand (Appendix C) and approval from the Gauteng Department of Education (Appendix D) was obtained. Following this, the head person, or the appointed representative of each school with a Snoezelen® room on their campus was contacted. Once their permission to participate in the study was obtained, information sheets (Appendix E) and consent forms (Appendix F) were sent by email to the representative of each school. Before sending the survey link to schools, the content validity measure was completed. Once the survey was deemed valid, the head person of each school was sent the survey link and asked to share it with each teacher and therapist employed at their school. There was an 'agree' button for participants to click once they had read and understood the information sheet, which

implied that they had given their consent. Surveys that were completed within a month were compiled and analysed using Microsoft Excel and later using SPSS 21 software. The results based on the data received from these surveys were compiled and analysed in the form of graphs and tables.

1.3.6 Data Analysis

Data obtained from this research study were collected on REDcap. The raw data were entered into an Excel spreadsheet using numbers to correspond to the participants and their responses. The researcher made use of descriptive statistics to describe the samples, percentages, and means. Pearson's correlation coefficients were used for data analysis. Point-biserial correlations were run to make inferences about the association between components of knowledge, perception, and demographic information. The statistical significance of these correlations was also evaluated with the level of statistical significance established at $p = 0.01$. Furthermore, 95% confidence intervals were calculated. Data were organised and summarised into graphs and summary tables showing samples, percentages, means, correlation coefficients, and p-values to be more easily understood. Data will be stored safely on a password-protected device for a five-year period after completion of the research study.

1.3.7 Trustworthiness

This study included various strategies to guarantee the trustworthiness of the research outcomes. The validity of this study was determined using a content validity questionnaire as described in the data collection section. According to Polit and Beck (2006), the item-level content validity index (I-CVI) values for each survey question should be no lower than 0.78, when there are six or more judges. Furthermore, many authors have indicated that a scale-level content validity index (S-CVI) of 0.80 or higher is acceptable. The values of each survey question met these criteria; thus, the survey was deemed valid and was used for this research study (Polit and Beck, 2006). Additionally, triangulation was used to combine findings from multiple sources. The data were reviewed by a data analyst and a research supervisor to ensure that the calculations and findings were accurate.

1.3.8 Ethical Considerations

Ethical clearance was applied for and acquired from the Human Research Ethics Committee (Medical) of the University of the Witwatersrand. Approval was also

obtained from the Gauteng Department of Education before data collection began. Informed consent from each school was obtained in the form of written consent. There was no use of confidential and private information that could allow for the identification of a participant after the results had been obtained. The participants were kept anonymous by assigning a number to each participant, as their names were not asked. When processing and releasing the results, only these research numbers were used. Participants obtained full disclosure of the aims of the study and the conditions of their participation by means of an information sheet. Participation was voluntary and participants were able to terminate participation in the research without any consequences and at any given time. Following the study, participants continue to have the opportunity to obtain further information about the general conclusions and results of the study, while still keeping personal information anonymous.

Chapter 2 Submissible Manuscript

Occupational Therapy in the Snoezelen® Room: Teachers' and Therapists' Knowledge and Perceptions of the Changes in Children's Behaviour and Performance.

Manuscript details

This chapter is presented as a manuscript prepared for submission to a journal. The manuscript has been submitted (Appendix G) as an original research article to the *South African Journal of Occupational Therapy (SAJOT)* and has been written in accordance with their submission guidelines (Appendix H). Thus, the format of this chapter may differ from that of the remainder of the report.

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ABSTRACT

Introduction: The Snoezelen® room, a multisensory environment (MSE), is often used in conjunction with sensory integrative techniques. Therefore, it may be of support in school-based occupational therapy intervention. Research has documented positive changes in children's performance in the MSE. However, research to suggest that changes could be carried over to external environments is limited. This study aimed to investigate the knowledge and perception of teachers and therapists regarding changes in children's behaviour and performance after therapy in the Snoezelen® room.

Methodology: A descriptive quantitative cross-sectional survey design by purpose sampling was used. Teachers and therapists working with children who received occupational therapy intervention in the Snoezelen® room participated.

Results: Strong positive, significant correlations were found, using the G*Power Version 3.1.9.4 statistics software, between the total impact of the Snoezelen® room and the children's level of arousal, as well as their behaviour and scholastic performance. After therapy in the Snoezelen® room, improvement of level of arousal was ranked as the biggest change, which appeared to be 'just right' for hours upon returning to the classroom.

Conclusion: Children's arousal levels changed due to sensory input, which carried over to the external environment. Due to this, most teachers and therapists perceive that the Snoezelen® room positively changed behaviour and scholastic performance.

INTRODUCTION

The Snoezelen® room is specifically designed to allow exploration of the quantity, nature, intensity, and arrangement of sensory stimuli[1]. Individuals are encouraged to explore the equipment in the environment to stimulate the senses of vision, hearing, smell, and touch, as well as proprioceptive and vestibular sensation[2]. The multisensory environment (MSE) such as Snoezelen® arose as the next logical development of sensory approaches and has become a relatively well-known benefit for therapeutic interventions that use a sensory

integrative frame of reference. Research has been done on positive change in performance within the MSE; however, little research has been done on the transfer of these changes into other environments, such as the school or classroom[3]. It is important to explore the transfer of knowledge, skills, and behaviour from the MSE to the classroom environment to validate the benefit of having an MSE within school environments. The aim of this study was to investigate the knowledge and perception of teachers and therapists about the change in child behaviour and performance, after occupational therapy in the Snoezelen® room, as a treatment modality in a specialised school environment. The broad areas of level of arousal, behaviour, and scholastic performance were explored to better achieve this aim[4].

LITERATURE REVIEW

Occupational therapists assist children to achieve maximum participation in daily activities, or occupations[5]. Jean Ayres was a neuropsychologist and occupational therapist who spent her career learning and determining how to treat children with behavioural and learning difficulties[6]. Learning disabilities are "unexpected, significant difficulties in academic achievement and related areas of learning and behaviour"[7(p3)]. Ayres emphasised that children with learning difficulties may also experience neurological dysfunction with respect to their ability to process sensory information[8]. To address these difficulties Ayres Sensory Integration® (ASI) theory was developed in 1972. ASI is "the neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment"[9(p1)]. The ASI theory describes how the nervous system receives sensory (sound, taste, touch, sight, vestibular, and proprioceptive) input and adjusts it to allow for an appropriate adaptive behavioural outcome[4,6]. Adaptive responses are seen as successful interactions with the environment in response to an environmental input, which is a building block for successful participation in occupations[6]. These building blocks of function are targeted through sensory integration therapy (SIT), to improve a child's overall participation in occupations. Neuroplasticity, which refers to the ability of the nervous system to adapt in response to sensory stimulation, can be strongly associated with SIT[10]. Young children respond well to SIT because there is still opportunity for neuroplasticity and recent evidence suggests that this process is of highest maturation in the first 8 years of life[11]. As children grow, the less changeable the brain becomes. This highlights the benefit of making use of SIT in school-based occupational therapy intervention, to meet therapy aims when children are younger, and their brains can still adapt due to neuroplasticity[8]. Combining the theory behind sensory integration and neuroplasticity, it has become evident that providing a child with enhanced personalised

sensation in everyday activity settings or altering their environment would allow a child to succeed[11].

The concept of the multisensory environment (MSE) was introduced in 1987 by two scientists, Hulsegge and Verheul, in the Netherlands, with their original purpose being relaxation and leisure exploration for people with profound intellectual disabilities[12,13]. Snoezelen®, a specific type of MSE, was later trademarked and introduced in the form of a specially designed room to encourage exploration of the quantity, nature, and intensity of sensory stimuli. Equipment that is often present can include white-coloured equipment, seating and walls that are soft and padded, mirror balls, bubble tubes, coloured lights, a projector, lava lamps, music, and colour-changing fibre-optic cables, all of which can be controlled by the individual to meet their sensory needs[14,15]. Individuals are invited to engage with the equipment of their choice, and according to their needs, to stimulate senses of vision, hearing, smell, touch, proprioceptive, and vestibular sensation[2]. The safe and relaxing environment reduces the notion of external emotional or physical pressure that might be experienced in other demanding environments[2]. The Snoezelen® room is windowless to reduce stimuli from the external environment. This creates a room that is more inviting for an individual who experiences sensory overload, such as a child who might be overwhelmed in a busy classroom or playground environment[16]. The rich sensory nature of a typical school environment can be overwhelming for certain children[17]. This could explain why some children have difficulties regulating themselves, keeping attention, engaging in social scenarios, participating in scholastic activities, and most importantly learning new skills[18]. Therefore, children with sensory integration challenges are at risk of experiencing difficulties participating in their education occupation[17]. According to Ayres, sensory integration challenges can negatively impact higher-order cognitive functions, such as executive functions, that allow for successful learning and academics, as well as the level of arousal needed for emotional regulation and self-regulation[6]. Therefore, the educational progress of a child with learning disabilities can be affected by their reduced ability to self-regulate their emotional and behavioural responses in a school setting[19]. Dunn's model of sensory processing describes neurological thresholds and how different thresholds affect self-regulation[20,21]. Self-regulation refers to the ability of a person to manage their own thresholds or level of arousal, using strategies. For example, a child who is often on the go and presents with a high level of activity is likely to have a high threshold for vestibular, or movement, input. Thus, this child would have a high level of arousal. This may lead the child to be disruptive to others or to themselves. Occupational therapists help children, and their caregivers, understand their thresholds and how to use sensory strategies to increase their engagement and learning[20]. Ultimately, children learn to

recognise, change, and maintain their level of arousal, using sensory strategies, to increase their participation in the classroom. Research shows that Snoezelen® can influence one's level of arousal, particularly related to changing levels of relaxation, emotion, and well-being by providing the correct amount of sensory input[22]. Acquiring self-regulation skills in the early years sets the foundation for positive classroom behaviour and academic performance later. Furthermore, for children with learning disabilities, academic skills such as reading, writing, and mathematics can be impacted[4]. These difficulties may be compounded by comorbid sensory and arousal difficulties, thus other skills such as cognitive skills become difficult for these children. According to the fourth edition of the occupational therapy practice framework, specific mental functions, or cognitive functions, include executive functioning skills, as well as attention, memory, perception, and thought[23]. Executive functioning skills refer to the cognitive skills that work together to help children solve intricate problem-solving tasks[24]. These difficulties may result in additional effort needed to achieve the same outcomes as peers and thus children with learning disabilities can also present with anxiety and behavioural changes that can further impact their participation in the classroom. Various research studies document the positive outcomes of the multisensory environment such as behavioural enhancement, reduced levels of pain, a balance of heart rate, calming effects, and increased motivation and attention[14,25,26]. In 2008, Botts et al.[2] conducted a study to delve into these effects, however, only two studies that included children were found[2]. Chan et al.[27] found an increase in children's positive emotions after intervention in the Snoezelen® room; however, no change in aggression or adaptive behaviours was found[27]. In their research, Shapiro et al.[28] found that a child's behaviour seemed to be more adaptive in the Snoezelen® room compared to a playroom[28]. In a study completed in 2011 by Stephenson and Carter[25], teachers' perceptions of the use of the MSE in schools were explored. This study was carried out as there is a gap in research on the outcomes of the Snoezelen® room especially with respect to children and schools[25]. Many teachers agreed that the MSE allows children to receive an opportunity to focus on specific tasks, while being free of distraction. Many educational professionals agreed that MSEs can improve behaviour, leading to better learning opportunities within the controlled environment[29]. However, not many teachers suggested the notion of these skills being carried over from the MSE to the classroom environment or other environments like the home, which is a vital component to explore if MSEs are to become significant in contributing to education[25]. This depicts the research gap surrounding the carryover of improvements from the Snoezelen® room to other environments. A recent study by Graham[30] in 2019, explored the use of sensory rooms for students with disabilities[30,31]. The study determined that an improvement in children's focus was most reported by teachers.

Furthermore, 57.5% of teachers reported improved following of instructions, 38.8% found students were better on task, 55% observed fewer negative behaviours, and 27.5% found that students had higher levels of motivation following the use of the MSE[30]. This suggests that the improvements noted within the MSE may be associated with improved classroom functioning. However, more research is required to build on these findings and determine which specific skill improvement is carried over from the MSE to the classroom. This will clarify the benefit of having a MSE in a school environment to positively impact children's learning experiences, particularly children with disabilities[31].

METHODOLOGY

Research Design

A descriptive, quantitative, cross-sectional survey design was used to address the aim of this study.

Population/sampling

There are two special education primary schools in Johannesburg with a functional Snoezelen® room on their campus, so the availability of participants was limited. Therefore, this study made use of purposive nonprobability sampling, as the sample of individuals was specifically chosen based on predetermined criteria[32]. The inclusion criteria required participants to be staff in special education primary schools who are teachers or therapists (occupational therapist, speech therapist, physiotherapist, psychologist, remedial therapist, social worker) by profession and who work with children who have received occupational therapy intervention in the Snoezelen® room. The G*Power Version 3.1.9.4 statistics software was used to determine the sample size according to the aim of the study and the specificity of the sample. It was determined that enough relevant data was collected once a minimum of 30 participants had completed the survey.

Research setting

This study was conducted online, using the REDcap platform. The participants all work in special education school settings.

Research instrument

This research instrument was an author-developed survey created using current available literature. The four-part survey included Section A, that sought to obtain demographic data through multiple choice questions. This included personal demographic data such as age, gender, profession, and years of experience, as well as questions regarding the participant's existing knowledge about the Snoezelen® room. Sections B, C, and D were

developed from literature on school-based occupational therapy and current knowledge on the benefits of the MSE related to SIT. These followed the same set of questions that included a four-point Likert scale, from very little effect to very effective, to measure the impact of the Snoezelen® room in improving a child's performance with respect to their 'level of arousal' (Section B), 'behaviour' (Section C) and 'scholastic performance' (Section D). Three-point Likert scales were used to measure changes in child performance following intervention in the Snoezelen® room (Becomes worse, Stays the same, Improves) as well as the duration (Minutes, Hours, Days) and frequency (Never, Sometimes, Always) of these changes. The outcomes that fell into each category were explored to determine the changes that were observed after intervention in the Snoezelen® room. Comment sections were included to enhance the richness of the data and allow participants to explain their answers. Concluding questions were asked to discover gender-based differences, as well as the participants' view on whether it is beneficial to have a Snoezelen® room on school campuses. An expert panel of occupational therapists conducted a content validity check on the survey, prior to distribution to participants. This included having six occupational therapists who have specialties in paediatric and sensory integrative practice, answer questions related to the relevance, clarity, simplicity, and ambiguity of the survey. According to Polit and Beck (2006), when there are six or more experts, the minimum requirements for excellent content validity of an instrument are I-CVIs of 0.78 or higher and an S-CVI of 0.80 or higher[33]. The I-CVIs for this study ranged from 0.83 to 1 and the S-CVI value was 0.98. Therefore, the survey had acceptable content validity, and no changes were required prior to distribution.

Data Collection

Data collection commenced once the University's ethical clearance processes were followed and approval from the Gauteng Department of Education was obtained. The headperson or appointed representative of each school with a Snoezelen® room on their campus was contacted and an information sheet and a consent form were sent by email to each school representative. Following retrieval of these signed documents, the survey link was shared by email to the school representatives, who forwarded the link to each teacher and therapist employed at their school. Participants accessed the survey through the online REDcap platform. This allowed participants to maintain anonymity. Online informed consent was obtained from all participants. Surveys that were completed within a month were compiled and analysed using Microsoft Excel and later using SPSS 21 software. Data were collated, cleaned, and coded for descriptive analysis.

Means and standard deviations, as well as data normality, were used to provide descriptive statistics of the participant demographics, as well as their knowledge and perception of the use of the Snoezelen® room. Pearson's correlation coefficients were used for data analysis. Point-biserial correlations were run to make inferences about the association between components of knowledge, perception, and demographic information. The statistical significance of these correlations was also evaluated with the level of statistical significance established at p = 0.01. Furthermore, 95% confidence intervals were calculated. Data were organised and summarised into graphs and summary tables showing samples, percentages, means, correlation coefficients, and p-values to be more easily understood.

Ethics

Ethical clearance was obtained from the Human Research Ethics Committee (Medical) of the University of Witwatersrand (HREC-M) (Certificate Number M210947). Approval was obtained from the Gauteng Department of Education. Informed consent was obtained from schools and individuals participating in this study. Participants were required to declare that they understood the research process and to provide voluntary consent to participate.

RESULTS

Demographic of participants

A total of 30 participants responded to the study and gave their consent. Referring to Table I, the participants comprised of 100% females (n = 30) whose ages ranged from 27 to 61 years, the mean age being 42.27. Most of the participants (60%) had known about the Snoezelen® room for 6-10 years, while 36.7% had known about the Snoezelen® room for only 1-5 years and 3.3% for more than 10 years. Most participants taught or gave therapy to more than one grade, between Grade R to Grade 7.

Table I: Demographic statistics of participants

	N = 30	%
Gender		
Female	30	100
Profession		
Teacher	13	43.3
Psychologist	2	6.7
Occupational Therapist	4	13.3
Speech and Language Therapist	5	16.7
Remedial Therapist	6	20.0
Years participants have been teaching or giving therapy		
1- 5 years	3	10.0
6-10 years	4	13.3
More than 10 years	22	73.3
Years participants have known about Snoezelen®		

1- 5 years	11	36.7
6-10 years	18	60.0
More than 10 years	1	3.3
Years participants have taught or given therapy to children who receive therapy in Snoezelen®		
Less than 1 year	3	10.0
1- 5 years	13	43.3
6-10 years	13	43.3
More than 10 years	1	3.3
Grades participants teach or give therapy to		
Grade R	6	20.0
Grade 1	11	36.7
Grade 2	14	46.7
Grade 3	14	46.7
Grade 4	12	40.0
Grade 5	8	26.7
Grade 6	6	20.0
Grade 7	6	20.0

Participants were asked about their perception of the benefits of the Snoezelen® room, as well as the diagnoses, age, and gender of the children who may benefit from the room.

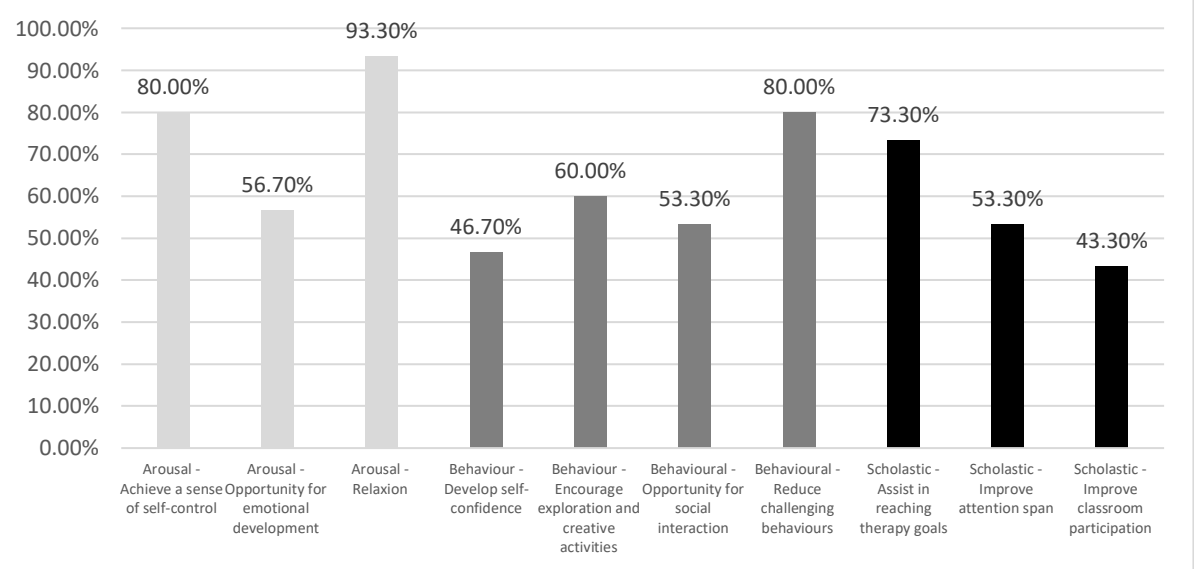


Figure 1: Benefits of the Snoezelen® room

Figure 1 indicates the percentages of participants who selected various benefits of occupational therapy intervention within the Snoezelen® room, based on pre-existing knowledge of the subject. Relaxation was the highest benefit reported (93.3%) while improving classroom participation was reported to be the least beneficial (43.3%).

Table II: Identified benefits of occupational therapy in the Snoezelen® room.

	Count	%
Benefits for Level of Arousal	25	80.60
Benefits for Scholastic Performance	18	58
Benefits for Behaviour	20	65

In Table II, it is evident that most of the participants (80.6%) identified Snoezelen® as the most beneficial to improve a child's level of arousal, based on their existing knowledge. Furthermore, the least number of participants (58%) identified Snoezelen® as beneficial for improving scholastic performance.

Table III: Participants knowledge of diagnosis suitable for intervention in the Snoezelen® room

	N = 30 n	%
ADHD	28	93.3
Cerebral Palsy	14	46.7
ASD	24	80
Down Syndrome	13	43.3
Dyslexia	20	66.7
Learning difficulties	24	80
Sensory integration difficulties	27	90
Emotional difficulties	28	93.3
Speech related difficulties	17	56.7
Other	4	13.3

Based on their previous knowledge, the participants report on the diagnoses they believe are suitable to receive occupational therapy intervention in the Snoezelen® room (Table III). Emotional difficulties (93.3%), ADHD (93.3%) and sensory integration difficulties (90%) were selected as most suitable. Cerebral Palsy (46.7%) and Down syndrome (43.3%) were selected as the least suitable.

Table IV: Participants knowledge of age groups suitable for intervention in the Snoezelen® room

	N = 30 n	%
0 – 12 months	5	16.7
13 months – 6 years	18	60
7 – 12 years	30	100
13 – 18 years	18	60
19 – 25 years	13	43.3
26 years and older	13	43.3

In Table IV, the age group that was selected as the most suitable for intervention in the Snoezelen® room was 7 to 12 years, as 100% of the participants selected this age group. 60% of the participants selected age groups from 13 months to 6 years and 13 to 18 years. The age group of 0 to 12 months were selected as least suitable (16.7%).

Perceptions of the impact of the Snoezelen® room

The results of this section are presented according to the number of participants who answered the questions. The percentages do not reflect 100% since some participants did not answer all questions.

Most of the participants (86.7%) reported that there are no differences in gender with respect to the changes observed after the occupational therapy intervention in the Snoezelen® room. Twenty-nine participants affirmed that they believe it is beneficial for schools to have a Snoezelen® room on their campus.

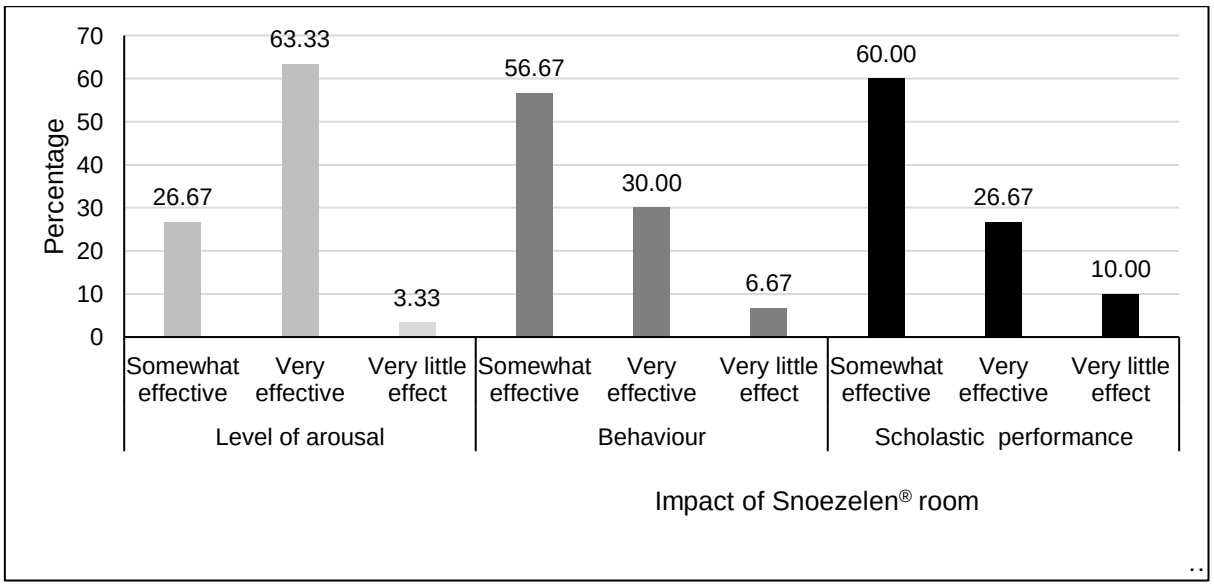


Figure 2: Participants perception of the impact of the Snoezelen® room on level of arousal, behaviour, and scholastic performance (n=28)

As can be seen in Figure 2, the total impact of occupational therapy in the Snoezelen® room was perceived to be significantly better for improving a child's level of arousal (Chi squared 38.78, p =0.001) with 63% of the participants indicating 'very effective'. A higher percentage of participants reported that it was 'somewhat effective' for both behaviour (57%) and scholastic performance (60%).

The level of change, as well as frequency and duration of change in level of arousal, behaviour, and scholastic appointment is shown in Table V.

Table V: Participants perception of the level, duration, and frequency of change in arousal, behaviour, and scholastic performance following occupational therapy intervention in the Snoezelen® room.

	Level of change			Frequency of change			Duration of change		
	n (%)								
	Just right	**Fast**	**Slow**	**Some-times**	**Always**	**Never**	**Hours**	**Days**	**Minutes**
Arousal	28 (93.33)	1 (3.33)		24 (80.00)	4 (13.33)		20 (66.67)	6 (20.00)	1 (3.33)
	Improves	**Stays the same**	**Become worse**	**Some-times**	**Always**	**Never**	**Hours**	**Days**	**Minutes**
Behaviour (mean)	(52.12)	(30.30)	(6.67)	(49.70)	(18.73)	(3.33)	(43.94)	(15.67)	(7.58)
Classroom disturbance	20 (66.67)	5 (16.67)	1 (3.33)	19 (63.33)	5 (16.67)		17 (56.67)	2 (6.67)	2 (6.67)
Impatience	18 (60.00)	8 (26.67)		16 (53.33)	6 (20.00)		13 (43.33)	1 (3.33)	6 (20.00)
Disrespect-defiance (mood changes)	14 (46.67)	10 (33.33)	1 (3.33)	17 (56.67)	4 (13.33)		12 (40.00)	4 (13.33)	5 (16.67)
External blame	11 (36.67)	13 (43.33)		15 (50.00)	5 (16.67)		11 (36.67)	6 (20.00)	2 (6.67)
Achievement anxiety (meltdowns)	20 (66.67)	4 (13.33)		11 (36.67)	7 (23.33)		15 (50.00)	2 (6.67)	1 (3.33)
External reliance (needs assistance)	13 (43.33)	11 (36.67)		14 (46.67)	7 (23.33)		14 (46.67)	3 (10.00)	4 (13.33)
Comprehension (cooperative, engaging)	11 (36.67)	14 (46.67)		12 (40.00)	9 (30.00)		15 (50.00)	5 (16.67)	1 (3.33)
Inattentive- withdrawn	20 (66.67)	5 (16.67)		17 (56.67)	4 (13.33)		17 (56.67)		3 (10.00)
Irrelevant responsive-ness	17 (56.67)	8 (26.67)		14 (46.67)	5 (16.67)	1 (3.33)	13 (43.33)	4 (13.33)	2 (6.67)
Creative initiative (self-confidence)	16 (53.33)	9 (30.00)		14 (46.67)	6 (20.00)	1 (3.33)	9 (30.00)	8 (26.67)	2 (6.67)
Need closeness to teacher	12 (40.00)	13 (43.33)		15 (50.00)	4 (13.33)	1 (3.33)	9 (30.00)	2 (6.67)	7 (23.33)
	Improves	**Stays the same**	**Become worse**	**Some-times**	**Always**	**Never**	**Hours**	**Days**	**Minutes**
Scholastic achievement (mean)	(61.11)	(22.22)		(52.22)	(13.33)	(3.33)	(28.33)	(21.67)	(11.67)
Academic	16 (53.33)	9 (30.00)		14 (46.67)	6 (20.00)	1 (3.33)	8 (26.67)	7 (23.33)	5 (16.67)
Cognitive skills	19 (63.33)	6 (20.00)		16 (53.33)	3 (10.00)		9 (30.00)	6 (20.00)	2 (6.67)
Executive functioning skills	20 (66.67)	5 (16.67)		17 (56.67)	3 (10.00)				
p-value	0.001	0.001		0.009	0.566		0.003	0.574	0.101

Level of Change

The change in level of arousal was perceived by a significantly higher percentage (93%) of participants (Chi squared 13.52, p =0.001) to improve after occupational therapy in the Snoezelen® room, followed by scholastic achievement (61%) and lastly behaviour (52%), indicating that overall performance in the external environment improves. A significantly higher percentage of participants felt that behaviour (30%) and scholastic achievement (22%) remained the same (Chi squared 20.98, p =0.001) compared to the percentage of participants who thought that of level of arousal (3%). Only behaviour was seen to

deteriorate by 6% of participants. At least two thirds of the participants perceived certain aspects of behaviour to improve after occupational therapy in the Snoezelen® room and these were classroom disturbance, impatience or impulsivity, achievement anxiety (meltdowns) and inattentive withdrawal. Similar results were seen of cognitive and executive functioning skills under scholastic achievement.

Frequency of change

The frequency in change of level of arousal was perceived by a high percentage of participants (80%) to change sometimes, with 13% of participants reporting change always occurs. Regarding the frequency of change in behaviour after occupational therapy in the Snoezelen® room, 49.70% of the participants noted change sometimes and 18.73% noted change always. Scholastic achievement was observed to change sometimes by 52.22% of the participants and always by 13.33% of the participants. Only 3.33% of the participants noted that scholastic performance never changes after occupational therapy in the Snoezelen® room. Some aspects of behaviour were perceived by more than half of the participants to change, sometimes, after intervention, and these included classroom disturbance, impatience, external blame, inattentive-withdrawal, and need for closeness to the teacher, as well as cognitive and executive functioning skills under scholastic performance. Lower percentages of participants reported that changes always occur.

Duration of Change

Most of the participants (66.67%) reported the level of arousal of children to change for hours after the occupational therapy intervention in the Snoezelen® room. The change in level of arousal was observed for days by 20% of the participants and for minutes by only 3% of the participants. Similarly, 43.94% of the participants noted change in behaviour for hours, 15.67% noted change for days, and 7.58% for minutes. Regarding scholastic achievement, 28.33% of participants noted a change for hours, 21.67% for days and 16.67% for minutes. The highest reported changes observed were for hours, which included level of arousal and behavioural aspects such as classroom disturbance, achievement anxiety, comprehension and inattentive-withdrawal.

Level of change and grade

The association between the grade and the total level of change was determined by point biserial correlations in Table VI. ‘Total change in arousal, behaviour, scholastic’ displayed a weak positive correlation with Grade 1 ($r(29) = 0.274$, $p = 0.150$) and Grade 2 ($r(29) = 0.266$, $p = 0.162$), however these were not statistically significant. Therefore, the change due to occupational therapy in the Snoezelen® room was not strongly associated with any particular grade.

Table VI: Correlations of impact scores

Variable 1	Variable 2	Statistic			
		Correlation	Count	Lower C.I.	Upper C.I.
Behaviour Impact	Level of Arousal Impact	0.60	27	0.28	0.80
	Behaviour Impact	1.00	28		
	Scholastic Impact	0.70	28	0.44	0.85
	Total Impact	0.90	28	0.80	0.95
Level of Arousal Impact	Level of Arousal Impact	1.00	28		
	Behaviour Impact	0.60	27	0.28	0.80
	Scholastic Impact	0.48	28	0.14	0.73
	Total Impact	0.82	28	0.65	0.91
Scholastic Impact	Level of Arousal Impact	0.48	28	0.14	0.73
	Behaviour Impact	0.70	28	0.44	0.85
	Scholastic Impact	1.00	29		
	Total Impact	0.86	29	0.73	0.93
Estimation is based on Fisher's l-to-Z transformation ** Correlation is significant at the 0.01 level (2-tailed)					

Table VI shows the correlations between the total impact of occupational therapy in the Snoezelen® room on level of arousal, behaviour, and scholastic performance of a child, as well as the impact in these areas individually. It was found that 'total impact' exhibited strong positive correlations with 'level of arousal impact' $r(28) = 0.821$, $p < 0.001$, 'scholastic impact' $r(29) = 0.863$, $p < 0.001$ and 'behaviour impact' $r(28) = 0.901$, $p < 0.001$. A strong positive correlation was observed between 'behaviour impact' and 'scholastic impact' $r(28) = 0.698$, $p < 0.001$. Moderately strong positive relationships were observed between 'behaviour impact' and 'level of arousal impact' $r(27) = 0.597$, $p = 0.001$ and 'level of arousal impact' and 'scholastic impact' $r(28) = 0.483$, $p < 0.001$. All these scores were statistically significant.

DISCUSSION

Much research has been done on positive changes in child performance within the MSE [14,25–27]. However, little research has been done on the transfer of these changes to other environments, such as the school environment[3]. This study aimed to review the perceptions of teachers and therapists about the use of MSE by identifying changes in the level of arousal, behaviour, and scholastic performance of children that they have observed within the classroom, therapy, or general school environment, after occupational therapy in the Snoezelen® room. For this study, it is assumed that occupational therapy sessions in the Snoezelen® room would follow a SIT approach as this frame of reference coincides with the sensory rich nature of MSE. This study confirmed that teachers and therapists do observe changes in children's performance in other environments after occupational therapy in the Snoezelen® room. Strong positive and significant correlations were found between the total impact of the Snoezelen® room and the level of arousal of the children, as well as their behaviour and their scholastic performance, suggesting that changes in these areas are perceived by teachers and therapists as related. The majority (60%) of the 30 female participants knew about the Snoezelen® room and taught or gave therapy to children who received intervention in the Snoezelen® room for around six to ten years, indicating that they had some prior exposure to the concept. This also highlights the fact that Snoezelen® is a relatively new concept in school environments, where the literature shows a large increase in the use of MSEs for children with learning disabilities in the past 15 years[12,22]. Furthermore, participants had a diverse range of professional backgrounds and extensive experience working with children, as 73% of participants had been doing so for more than 10 years. Their years of experience may have contributed to their knowledge and perceptions of the Snoezelen® room. Teachers' and therapists' diverse professional backgrounds, extensive experience, and understanding of suitable age groups and diagnoses align with the evidence commonly found in MSE research.

In a study by Graham[30] in 2019, it was determined that students with special needs who attended schools with an MSE on campus showed better improvements in academic performance and behavioural performance compared to their peers at schools without an MSE on campus[30]. Interestingly, 96.7% of the participants in this study affirmed that they believe it is beneficial for schools to have a Snoezelen® room on their campus; however, 'improving classroom participation' was their least reported benefit of intervention in the Snoezelen® room. In fact, the highest reported category of benefits of the Snoezelen® room was the improvement of the level of arousal, followed by behaviour, and lastly, scholastic performance. This indicates that a substantial majority of teachers and therapists perceive that occupational therapy in the Snoezelen® room has a positive impact on arousal levels

of children. Interestingly, participants found that the Snoezelen® room is most suitable for children diagnosed with ADHD, emotional difficulties, and sensory integration difficulties rather than diagnoses that are typically known to impact school performance, such as dyslexia or learning disabilities. Children with the former three diagnoses are all at risk of having trouble with regulation. There is existing evidence that Snoezelen® can affect one's level of arousal, particularly related to changing levels of relaxation, emotion, and well-being through the provision of the correct amount of sensory input[22]. Ultimately, through being in a controlled sensory environment, children learn to monitor, maintain, or change their state of arousal to increase participation and performance in the classroom, in other words, learn to self-regulate[20,34]. This study found that the children were observed to have a 'just right' level of arousal for hours upon returning to the classroom after the occupational therapy intervention in the Snoezelen® room[34]. Although all children naturally have changes in their level of alertness throughout the day, children with sensory integration difficulties find it more challenging to remain alert and focused consistently throughout the school day[35]. The lack of ability to self-regulate or maintain one's level of arousal has been shown to impact a child's participation in the classroom. In 2004, research by Raver[36] highlighted the fact that self-regulation in early development is as important as learning to read[36]. In fact, children who have better developed regulation skills show increased performance in academic activities such as maths and literacy[37]. Additionally, Post, Boyer, and Brett[38] define self-regulation as a learning tool that is highly predictive of academic success[38]. Similarly, in this study, a positive correlation was found between Snoezelen's® impact on a child's level of arousal and its impact on a child's scholastic performance. This suggests that changes in scholastic performance and arousal are perceived by teachers and therapists as related. This evidence highlights two contributions to this growing body of research. First, the positive correlations suggest that as a child's level of arousal improves, so would their scholastic performance improve. Second, the sensory input a child receives through occupational therapy intervention in the MSE has a positive impact on improving the level of arousal of a child, which is then transferred to an external environment such as the classroom. Therefore, occupational therapy in the Snoezelen® room improves a child's scholastic performance through improving their level of arousal. Many participants (61%) reported that the overall scholastic performance of children improved after the occupational therapy intervention in the Snoezelen® room for hours upon return to the classroom. Majority of participants (80%) observed that this change occurs sometimes. At least two thirds of the participants reported that cognitive skills such as attention and following instructions, and executive functioning skills such as problem solving and pace had improved in an external environment following the intervention in the Snoezelen® room, while only half of the participants noted improvement in academic skills such as reading

and handwriting[39,40]. However, the frequency of these changes was not explicit. This combination of evidence indicates that a child's ability to maintain their level of arousal is essential for their academic success, specifically their cognitive and executive functioning skills. This also shows that the participants had relatively good prior knowledge of the Snoezelen® room.

Researchers reason that the development of self-regulation skills is vital for younger children, as this lays the foundation for early childhood education and intersects with all aspects of behaviour and performance output[20,37]. Children who can self-regulate are more likely to stay focused, take turns, and follow instructions, and are less likely to show impulsivity or aggressive behaviour[37]. In this study, more than half the participants (52%) reported that the overall behaviour of children improved after the occupational therapy intervention in the Snoezelen® room upon returning to the classroom. Participants perceived changes in children's behaviour to occur sometimes and last for hours. This indicates that most teachers and therapists believe that occupational therapy in the Snoezelen® room has a positive impact on children's behaviour upon returning to the classroom. Examples of behaviour that at least two-thirds of participants reported to improve included classroom disturbance, impulsivity, achievement anxiety, and inattention or withdrawal[41]. Although changes in these behaviours were most often only observed sometimes. One recent study by Graham[30] in 2019, explored the use of sensory rooms for students with disabilities[30,31]. The study determined that teachers reported the highest improvement in the focus of the children. Furthermore, 57.5% of teachers reported improved follow-up of instructions, 38.8% found that students were better on task, 55% observed fewer negative behaviours, and 27.5% found that students had higher levels of motivation after the use of the MSE[30]. Evidence, from both Graham's study and this study, suggests that MSEs contribute to improving behaviour, according to the perceptions of teachers and therapists of children in external environments. A strong positive correlation was found between the impact of Snoezelen® in improving the level of arousal and its impact in improving behaviour. Similarly, to the above-mentioned findings, this suggests that occupational therapy in the Snoezelen® room contributes to improving a child's behaviour in the classroom through improving their level of arousal. However, this study also found a strong positive correlation between Snoezelen's® impact on behaviour and its impact on scholastic performance. Thus, in agreement with Ashburner et al.[19], acquiring self-regulation skills in early years lays the foundation for positive classroom behaviour, and thus academic performance later.

On the topic of targeting these areas of development 'in the early years', it is beneficial to mention the relevance of neuroplasticity and early intervention in relation to school performance. Young children respond well to SIT because there is still an opportunity for

neuroplasticity. This alludes to the fact that brain function is not permanent and can be changed. As children grow, the neuroplasticity decreases. Recent evidence suggests that changes in brain structure due to neuroplasticity have been observed from three to five months of age, with the process at highest maturation in the first 8 years of life[11]. In this study, the most common grades that teachers and therapists interacted with were Grade 2 and Grade 3, among Grade R to Grade 7. There was a weak positive correlation between Snoezelen's® total impact on a child's level of arousal, behaviour and scholastic performance and Grade 1, as well as Grade 2. However, this was not statistically significant. Making use of SIT in school-based occupational therapy intervention has been shown to be beneficial, as these aims can be more easily met in younger children whose brains can still adapt due to neuroplasticity[8]. Thus, with early intervention, specifically related to SIT, being a popular topic among research, it may be beneficial to continue to use the Snoezelen® room specifically for children in Grade 1 and Grade 2. However, more importantly, it poses questions for future studies on the impact of occupational therapy in the Snoezelen® room, for children under school age (6 years old), as well as how this type of intervention can impact their schooling performance if it were introduced earlier in development[42].

Based on the findings of this study, it can be foreseen that having a Snoezelen® room on school campuses would be beneficial for some pertinent reasons. Since strong positive and significant correlations were found between the total impact of the Snoezelen® room and the level of arousal of children, as well as their behaviour and their scholastic performance, it is evident that each component should not be targeted in isolation from the others, to achieve therapy or school-based aims. Importantly, a child's ability to self-regulate and maintain their level of arousal has been shown to be fundamental. Subsequently, the question around 96.7% of participants affirming that it is beneficial for schools to have a Snoezelen® room on their campus, despite, 'improving classroom participation' being their least reported benefit of the Snoezelen® room, can be clarified. Consistent with extensive research surrounding self-regulation of children, acquiring self-regulation skills in the early years lays the foundation for positive classroom behaviour and academic performance later[19], specifically, the self-regulation skills a child develops through SIT occupational therapy in the Snoezelen® room, in relation to the findings of this study. Therefore, participants essentially alluded to the results of this study that it is beneficial to have a Snoezelen® room on school campuses not necessarily to directly enhance scholastic performance, but to improve scholastic performance and children's classroom behaviour, through improving their level of arousal. Furthermore, by having a Snoezelen® room on school campuses, school-based occupational therapy aims can be more readily met in

sensory controlled, non-distracting environments. Additionally aims can be more readily met in schools for younger children whose brains can still adapt due to neuroplasticity [8].

Limitations of the study

This study had a narrow sample size. Due to this sample size, the generalisation of these findings to other settings and the larger context of South Africa should be done with caution. It is not known if the research survey reached the whole potential population and only 30 responses were used. This could be due to participants having received the survey, but not completing it. These factors may have caused a non-response bias which could have skewed the results. Although the quantitative research design served as an initial framework to gather baseline information, a qualitative research design could offer more detailed and nuanced perceptions. Additionally, survey pilot testing was not completed.

This study presented generalised findings of the impact of the Snoezelen® room on children in Grade R to Grade 7. However, many participants reported that the selected questions were difficult to answer confidently as the information may be applied differently to different children, and different children may respond differently to therapy in the Snoezelen® room. Additionally, the information gathered through participants' perceptions is subjective. Therefore, it is recommended that further research be carried out to explore the impact of the Snoezelen® room, where findings can be more child-specific and based on age, diagnosis, or additional demographic information and changes can be objectively measured. Furthermore, since the Snoezelen® room is often used in conjunction with SIT, it may be unclear whether changes observed following therapy in the Snoezelen® room are due to the multisensory environment or to SIT itself. Further research will be helpful in providing clarification.

CONCLUSION

The diverse professional background of teachers and therapists, extensive experience, and understanding of suitable age groups and diagnoses align with the principles and recommendations commonly found in MSE research. In this study, the impact of occupational therapy using a SIT approach in the Snoezelen® room is highlighted. Since strong positive and significant correlations were found between the total impact of the Snoezelen® room and the level of arousal of children, as well as their behaviour and their scholastic performance, it is evident that each component should not be targeted in isolation from the others, to achieve maximum therapy or school-based aims. Importantly, a child's ability to self-regulate and maintain their level of arousal has been shown to be fundamental. Although all areas were shown to improve in an external environment after occupational

therapy intervention in the Snoezelen® room, a substantial majority of teachers and therapists perceived that occupational therapy in the Snoezelen® room has a positive impact on improving child behaviour and scholastic performance, through improving their level of arousal. Consistent with extensive research on self-regulation in children, the acquisition of self-regulation skills in the early years lays the foundation for positive classroom behaviour and academic performance later.

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Conflict of interests

The authors have no conflict of interest to declare.

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Author contributions

Mika Solomon completed the study towards a postgraduate degree and was responsible for drafting the manuscript. Marica Botha supervised the study and edited the manuscript.

Chapter 3 Synthesis

3.1 Conclusion

The diverse professional backgrounds of teachers and therapists, extensive experience, and understanding of suitable age groups and diagnoses align with the principles and recommendations commonly found in MSE research. Thus, the first objective of this study was reached, in that an understanding of teachers' and therapist's existing knowledge on the Snoezelen® room was determined to be supported by their experience in this topic. In this study, the impact of occupational therapy using a SIT approach in the Snoezelen® room is highlighted. Since strong positive and significant correlations were found between the total impact of the Snoezelen® room and children's level of arousal, as well as their behaviour and their scholastic performance, it is evident that each component should not be targeted in isolation of the others, to achieve maximum therapy or school-based aims. Thus, the objectives that aimed to understand teacher's and therapists' perceptions of the impact of occupational therapy in the Snoezelen® room, on level of arousal, behaviour and scholastic performance, were met. Although all areas were shown to improve in an external environment after occupational therapy intervention in the Snoezelen® room, a substantial majority of teachers and therapists perceived that the Snoezelen® room had a positive impact on improving child behaviour and scholastic performance, through improving their level of arousal. Thus, a child's ability to self-regulate and maintain their level of arousal has shown to be fundamental. Consistent with extensive research on self-regulation in children, the acquisition of self-regulation skills in the early years lays the foundation for positive classroom behaviour and academic performance later.

3.2 Limitations

This study had a narrow sample size. Due to this sample size, generalisation of these findings to other settings or the larger context of South Africa should be done with caution. It is not known whether the research survey reached the entire potential population and only 30 responses were used. This could be due to participants having received the survey but not completed it. These factors may have caused a non-response bias that could have skewed the results. Additionally, survey pilot testing was not completed.

3.3 Recommendations

Based on the findings in this study the following recommendations are made:

- Further research on the topic of early intervention in relation to MSEs is recommended.
- Future studies on the effectiveness of occupational therapy in the Snoezelen® room for children under school age (6 years old), as well as how this type of intervention may impact their schooling performance if it were introduced earlier in development, may be beneficial.
- Further research on the topic of this study in larger populations is recommended to broaden the results and to investigate how MSEs can impact different children's performance in external environments.

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Appendix A: Survey

TEACHERS AND THERAPISTS KNOWLEDGE AND PERCEPTION OF THE EFFECTS OF SNOEZELEN® IN OCCUPATIONAL THERAPY TREATMENT

Hi! I am an Occupational Therapist, Mika Solomon, completing a master's degree in Occupational Therapy at the University of the Witwatersrand. The title of my study is as follows: **Teachers' and Therapist's knowledge and perception of the effects of Snoezelen® in occupational therapy treatment.**

The aim is to investigate teachers' and therapist's perceptions of the effects of the Snoezelen® room on children's behaviour and changes in performance, as an occupational therapy modality in a specialised school environment. I would be most grateful if you and your staff members would consider participating in this work. Much research has been done surrounding the positive effects on children's behaviour and performance within the multi-sensory environment (MSE), however there has been little research done on the transfer of these changes in behaviour and changes in performance into other environments, such as the school or classroom environment. It is important that the transfer of knowledge, skills and behaviour from the MSE into the classroom environment be explored to validate the benefit of having a MSE/Snoezelen room within school environments. This will be done by reviewing teachers' and therapist's perceptions of the use of the MSE by having them identify changes in behaviour and performance that they have noted within the classroom, therapy sessions or school environment, following occupational therapy intervention within the Snoezelen® room.

What do we expect from the participants in the study? You will be asked to complete an online survey that will require about 15 minutes of your time.

May I withdraw from the study? Certainly, you may do this at any time without having to give a reason. Remember that the study is completely voluntary and not taking part in it, or withdrawing from it, carries no penalty of any sort.

What about confidentiality? Confidentiality will be maintained by the use of a code instead of names on all results. Names will not be asked in order to maintain anonymity.

If you have any queries or concerns or would like further clarity, more information may be obtained from Mika Solomon at email address, mikaashleysolomon@gmail.com

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research. If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za.

Thank you for you participation in my research!

Mika Solomon

BSc (OT)

INFORMED CONSENT TO PARTAKE IN THE FOLLOWING STUDY: TEACHERS' AND THERAPIST'S KNOWLEDGE AND PERCEPTION OF THE EFFECTS OF SNOEZELEN® IN OCCUPATIONAL THERAPY TREATMENT.

I confirm that I have been informed by Mika Solomon about the nature of the study.
I have also read and understood the information sheet.
I have also been given the opportunity to ask questions.
I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.
I understand that my personal information will be kept confidential.
I understand that I can obtain information in relation to the project at any time by contacting the researcher.

Data will be kept for two years if published or six years if not published, after this period the data will be destroyed.

I agree to take part in the abovementioned study:

- ○ Yes
- ○ No

1. Gender

- ○ Female
- ○ Male
- ○ Other

2. Age

3. Select your profession

- ○ Teacher
- ○ Psychologist
- ○ Occupational Therapist
- ○ Social Worker
- ○ Speech and Language Therapist
- ○ Remedial Therapist
- ○ Physiotherapist
- ○ Other

4. Indicate how many years you have been teaching or giving therapy

- ○ Less than 1 year
- ○ 1- 5 years
- ○ 6-10 years
- ○ More than 10 years

5. What grades do you teach or give therapy to?

- ☐ Grade R
- ☐ Grade 1
- ☐ Grade 2
- ☐ Grade 3
- ☐ Grade 4
- ☐ Grade 5
- ☐ Grade 6
- ☐ Grade 7

6. How many years have you known about the Snoezelen® room?

- ○ Less than 1 year
- ○ 1- 5 years
- ○ 6-10 years
- ○ More than 10 years

7. How many years have you taught or given therapy to children who receive intervention in the Snoezelen® room?

- ○ Less than 1 year
- ○ 1- 5 years
- ○ 6-10 years
- ○ More than 10 years

8. What do you think the benefits of occupational therapy in the Snoezelen® room are? Please select from the list below.

- ☐ Relaxation (calming, level of arousal, regulation, decrease anxiety)
- ☐ Develop self-confidence
- ☐ Achieve a sense of self-control (coping strategies)
- ☐ Encourage exploration and creative activities
- ☐ Establish rapport with caregivers, teachers and/or therapists
- ☐ Provide leisure and enjoyment (fun)
- ☐ Promote choice
- ☐ Improve attention span
- ☐ Reduce challenging behaviours
- ☐ Assist in reaching therapy goals (motor skills, visual perception, language)
- ☐ An opportunity for social interaction
- ☐ Enhancement of communication
- ☐ An opportunity for emotional development
- ☐ Stimulation of all the senses
- ☐ Improve classroom participation

9. Which age groups do you think are suitable for intervention in the Snoezelen® room?

- ☐ 0 - 12 months
- ☐ 13 months - 6 years
- ☐ 7 - 12 years
- ☐ 13 - 18 years
- ☐ 19 - 25 years
- ☐ 26 years and older

10. Which type of diagnoses do you think are suitable for OT intervention in the Snoezelen® room?

- ☐ ADHD
- ☐ Cerebral Palsy
- ☐ ASD
- ☐ Down Syndrome
- ☐ Dyslexia
- ☐ Learning difficulties
- ☐ Sensory integration dysfunction/Sensory processing disorder
- ☐ Emotional difficulties
- ☐ Speech related difficulties
- ☐ Other

LEVEL OF AROUSAL

Please read the table below in order to understand the terminology needed to answer questions 11-13

SLOW (LOW)	JUST RIGHT	FAST (HIGH)
The slow speed is often described as sluggish or spaced out.	The just right speed is when it is easy to focus, learn and play.	The fast speed can be described as over-excited, hyper, or out of control.
The child may appear to not be listening or is unable to stay on task.	The child can maintain appropriate attention to tasks and appears to be learning and problem solving through his work, requiring minimal support.	The child may present with an inability to remain seated, difficulty concentrating and moving quickly between activities. The child will have trouble attending to tasks and remaining focused.

Adapted from The Alert Program®

	Not at all effective	Very little effect	Somewhat effective	Very effective
11. Please indicate on the scale to which degree you find occupational therapy in the Snoezelen® room effective in improving a child's level of arousal:	○	○	○	○

12. Please use the rating scales to describe your observations on changes in a child's level of arousal that you observe following their OT intervention in the Snoezelen® room.

	On which level of arousal do the children appear following OT in the Snoezelen room?	How often is this level of arousal noted following OT in the Snoezelen room?	For how long is this level of arousal noted for following OT in the Snoezelen room?
Level of arousal	○ Slow ○ Just right ○ Fast	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days

13. Do you have any additional comments about changes in a child's level of arousal following OT intervention in the Snoezelen® room?

BEHAVIOUR

	Not at all effective	Very little effect	Somewhat effective	Very effective
14. Please indicate on the scale to which degree you find occupational therapy in the Snoezelen® room effective in improving a child's behaviour:	○	○	○	○

15. Please use the rating scales to describe your observations on changes in a child's behaviour that you observe following their OT intervention in the Snoezelen® room.

	In what way does a child's behaviour change following OT in the Snoezelen room?	How often is this change noted following OT in the Snoezelen room?	For how long are these changes present following OT in the Snoezelen room?
Classroom disturbance (fidgeting, chattiness, remaining seated)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Impatience (impulsivity)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Disrespect-defiance (mood changes)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
External Blame	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Achievement anxiety (meltdowns, withdrawal)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
External reliance (requires assistance)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Comprehension (cooperative, engaging)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Inattentive-withdrawn (attention, sleepiness)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Irrelevant responsiveness (shouting out	○ Becomes worse	○ Never ○ Sometimes	○ Minutes ○ Hours

answers, complaints of body aches)	○ Stays the same ○ Improves	○ Always	○ Days
Creative initiative (self-confidence)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Need closeness to teacher (neediness)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days

Derived from the Devereux Elementary School Behavior rating scale

16. Do you have any additional comments about changes in a child's behaviour following OT intervention in the Snoezelen® room?

SCHOLASTIC PERFORMANCE

	Not at all effective	Very little effect	Somewhat effective	Very effective
17. Please indicate on the scale to which degree you find occupational therapy in the Snoezelen® room effective in improving a child's scholastic performance:	○	○	○	○

18. Please use the rating scales to describe your observations on changes in a child's scholastic performance that you observe following their OT intervention in the Snoezelen® room.

	In what way does a child's scholastic performance change following OT in the Snoezelen room?	How often is this change noted for following OT in the Snoezelen room?	For how long are these changes noted following OT in the Snoezelen room?
Academic skills (e.g.: mathematics, reading, spelling, handwriting)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Cognitive skills (e.g.: attention, memory, perception, following instructions)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days
Executive functioning skills (e.g.: planning, problem solving, organization, work pace, initiation and completion of tasks)	○ Becomes worse ○ Stays the same ○ Improves	○ Never ○ Sometimes ○ Always	○ Minutes ○ Hours ○ Days

19. Do you have any additional comments about changes in a child's scholastic performance following OT intervention in the Snoezelen® room?

20. Do you find these changes in level of arousal, behaviour or scholastic performance more prevalent in female or male children?

- ○ Female
- ○ Male
- ○ No difference in gender

21. Do you think it is beneficial for schools to have a Snoezelen® room on their campus?

○ Yes ○ No

Submit

Appendix B: Content Validity

An expert panel of occupational therapists conducted a content validity check on the survey, prior to distribution to participants. This included having six occupational therapists who have specialties in paediatric and sensory integrative practice, answering questions related to the relevance, clarity, simplicity, and ambiguity of the survey.

Degree of relevance:	Degree of clarity	Degree of Simplicity	Degree of Ambiguity
1= Not relevant 2= Items need some revision 3= Relevant 4= Very relevant	1= not clear 2= items need some revision 3= clear but needs minor revision 4= very clear	1= not simple 2= items need some revision 3= simple but needs minor revision 4= very simple	1= Doubtful 2= items need some revision 3= no doubt but needs some revision 4= meaning is clear

According to Polit and Beck (2006), when there are six or more experts, the minimum requirements for excellent content validity of an instrument are as follows: the item-level content validity index (I-CVI) values for each survey question should be no lower than 0.78, when there are six or more judges and the scale-level content validity index (S-CVI) of 0.80 or higher is acceptable. The I-CVI for this study ranged from 0.83 to 1 and the S-CVI value was 0.98. Therefore, the survey had acceptable content validity and no changes were required prior to distribution (Polit and Beck, 2006).

Original data used for content validity calculations								
Item	Rater 1	Rater 2	Rater 3	Rater 4	Rater 5	Rater 6	Agreement	I-CVI
gender_relevance	3	4	3	4	3	1	5	0.833333
gender_clarity	4	4	4	4	4	4	6	1
gender_simplicity	4	4	4	4	4	4	6	1
gender_ambiguity	4	4	4	4	4	4	6	1
age_relevance	3	4	3	4	4	1	5	0.833333
age_clarity	4	4	4	4	4	4	6	1
age_simplicity	4	4	4	4	4	4	6	1
age_ambiguity	4	4	4	4	4	4	6	1
profession_relevance	4	4	4	4	4	4	6	1
profession_clarity	4	4	4	4	4	4	6	1
profession_simplicity	4	4	4	4	4	4	6	1
profession_ambiguity	4	4	4	4	4	4	6	1
years_teaching_relevance	4	4	4	4	3	3	6	1
years_teaching_clarity	4	4	4	4	4	4	6	1
years_teaching_simplicity	4	4	4	4	4	3	6	1
years_teaching_ambiguity	4	4	4	4	4	3	6	1
grades_teaching_relevance	4	4	4	4	4	4	6	1
grades_teaching_clarity	4	4	4	4	3	4	6	1
grades_teaching_simplicity	3	4	4	4	3		5	0.833333
grades_teaching_ambiguity	4	4	4	4	3		5	0.833333
years_snoezelen_relevance	4	2	4	4	3	4	5	0.833333
years_snoezelen_clarity	3	3	4	4	4	3	6	1
years_snoezelen_simplicity	4	3	4	4	4	3	6	1
years_snoezelen_ambiguity	4	3	4	4	4	3	6	1
snoezelen_intervention_relevance	4	3	4	4	4	4	6	1
snoezelen_intervention_clarity	3	4	4	4	4	3	6	1
snoezelen_intervention_simplicity	4	4	4	4	4	4	6	1
snoezelen_intervention_ambiguity	4	4	4	4	4	3	6	1
ot_benefits_relevance	4	4	4	4	4	4	6	1
ot_benefits_clarity	4	4	4	4	4	4	6	1
ot_benefits_simplicity	3	4	4	4	4	4	6	1
ot_benefits_ambiguity	4	4	4	4	4	4	6	1
age_group_intervention_relevance	4	2	4	4	4	3	5	0.833333
age_group_intervention_clarity	4	3	4	4	4	4	6	1
age_group_intervention_simplicity	3	3	4	4	4	4	6	1
age_group_intervention_ambiguity	4	3	4	4	4	4	6	1
diagnosis_intervention_relevance	4	4	4	4	4	4	6	1
diagnosis_intervention_clarity	4	4	4	4	4	4	6	1
diagnosis_intervention_simplicity	3	4	3	4	4	4	6	1
diagnosis_intervention_ambiguity	4	4	4	4	4	4	6	1
level_of_arousal_relevance	4	4	3	4	4	4	6	1
level_of_arousal_clarity	4	4	3	4	4	2	5	0.833333
level_of_arousal_simplicity	4	4	3	4	4	2	5	0.833333
level_of_arousal_ambiguity	4	4	4	4	4	3	6	1
arousal_rating_scale_relevance	4	3	4	4	4	4	6	1
arousal_rating_scale_clarity	4	3	4	4	3	3	6	1
arousal_rating_scale_simplicity	3	3	4	4	3	3	6	1
arousal_rating_scale_ambiguity	4	3	4	4	4	3	6	1
comments_arousal_level_relevance	4	4	4	4	4	3	6	1
comments_arousal_level_clarity	4	4	4	4	4	3	6	1
comments_arousal_level_simplicity	4	4	3	4	4	3	6	1
comments_arousal_level_ambiguity	4	4	4	4	4	3	6	1
behaviour_effectiveness_relevance	4	4	4	4	4	4	6	1
behaviour_effectiveness_clarity	4	4	4	4	4	3	6	1
behaviour_effectiveness_simplicity	4	4	4	4	4	3	6	1
behaviour_effectiveness_ambiguity	4	4	4	4	4	3	6	1

behaviour_rating_scale_relevance	4	3	4	4	4	4	6	1
behaviour_rating_scale_clarity	4	4	4	4	4	3	6	1
behaviour_rating_scale_simplicity	3	4	4	4	4	3	6	1
behaviour_rating_scale_ambiguity	4	4	4	4	4	3	6	1
comments_behaviour_relevance	4	4	4	4	3	4	6	1
comments_behaviour_clarity	4	4	4	4	4	4	6	1
comments_behaviour_simplicity	4	4	4	4	4	4	6	1
comments_behaviour_ambiguity	4	4	4	4	4	4	6	1
scholastic_performance_relevance	4	4	4	4	4	3	6	1
scholastic_performance_clarity	4	4	4	4	4	3	6	1
scholastic_performance_simplicity	4	4	4	4	4	3	6	1
scholastic_performance_ambiguity	4	4	4	4	4	3	6	1
performance_rating_scale_relevance	4	3	3	4	4	4	6	1
performance_rating_scale_clarity	4	3	4	4	2		4	0.666667
performance_rating_scale_simplicity	3	3	4	4	3	4	6	1
performance_rating_scale_ambiguity	4	3	3	4	3	4	6	1
comments_sch_performance_relevance	4	3	3	4	3	3	6	1
comments_sch_performance_clarity	4	4	4	4	4	3	6	1
comments_sch_performance_simplicity	4	4	4	4	4	3	6	1
comments_sch_performance_ambiguity	4	4	4	4	4	3	6	1
snoezelen_benefits_relevance	4	4	4	4	4	4	6	1
snoezelen_benefits_clarity	4	4	4	4	4	4	6	1
snoezelen_benefits_simplicity	4	4	4	4	4	4	6	1
snoezelen_benefits_ambiguity	4	4	4	4	4	2	5	0.833333
teachers_and_therapists_knowledge_and_perception_complete	2	2	2	2	2	2	0	0
							S-CVI/Ave	0.965021
							Total Agreement	78
							S-CVI/UA	0.975

Appendix C: Ethical Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG	HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research and Innovation)

TO:	Ms MA Solomon School of Therapeutic Sciences Department of Occupational Therapy Medical School University
	E-mail: mikaashleysolomon@gmail.com
CC:	Supervisor: Ms M Botha <Marica.Botha@wits.ac.za> and <HREC-Medical Research Office@wits.ac.za>
FROM:	Mr Iain Burns Human Research Ethics Committee (Medical) Tel: 011 717 1252
	E-mail: Iain.Burns@wits.ac.za
DATE:	2021/11/29
REF:	R14/49
PROTOCOL NO:	**M210947** (This is your ethics application reference number. Please quote it in all enquiries, oral or written, relating to this study.)
PROJECT TITLE:	*Teachers' and therapist's knowledge and perception of the effects of Snoezelen® in occupational therapy treatment*

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to Government funding of the University.



MSWorks2000/Iain0007/Clearscan.wps

Appendix D: GDE Approval Certificate

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	**14 October 2021**
Validity of Research Approval:	**08 February 2022– 30 September 2022** **2021/311**
Name of Researcher:	**Solomon MA**
Address of Researcher:	**119 Froom Street**
	Athol
	Johannesburg
Telephone Number:	**0741411412**
Email address:	**mikaashleysolomon@gmail.com**
Research Topic:	**Teachers and therapists knowledge and perception of the effects of Snoezelen in occupational Therapy**
Type of qualification	**Masters**
Number and type of schools:	**3 LSEN Schools**
District/s/HO	**Johannesburg North**

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

15/10/2021

The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

1. *Letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.*

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

3. ***Because of COVID 19 pandemic researchers can ONLY collect data online, telephonically or may make arrangements for Zoom with the school Principal. Requests for such arrangements should be submitted to the GDE Education Research and Knowledge Management directorate. The approval letter will then indicate the type of arrangements that have been made with the school.***
4. ***The Researchers are advised to make arrangements with the schools via Fax, email or telephonically with the Principal.***
5. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.*
6. *A letter / document that outline the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.*
7. *The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.*
8. *Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.*
9. *Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.*
10. *Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.*
11. *It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.*
12. *The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.*
13. *The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.*
14. *On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.*
15. *The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.*
16. *Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.*

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

.....

Mrs Faith Tshabalala
Acting Director: Education Research and Knowledge Management

DATE: 15/10/2021

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

Appendix E: Information Sheet

INFORMATION SHEET

Hi there!

My name is Mika Solomon. I am an MSc (OT) student at the University of the Witwatersrand. I am carrying out a study that aims to investigate teacher's and therapists' perceptions of the effects of the use of the Snoezelen® room in occupational therapy intervention. I would be most grateful if you and your staff members would consider participating in this work.

Why am I doing this? Much research has been done surrounding the positive effects on children's behaviour and performance within different types of multisensory environments (MSE), such as the Snoezelen® room. However there has been little research done on the transfer of these changes of behaviour into other environments, such as the school or classroom environment. It is important that the transfer of knowledge, skills and behaviour from the MSE into the classroom environment be explored to validate the benefit of having a MSE within school environments. This will be done by reviewing teachers' and therapist's perceptions of the use of the MSE by having them identify changes in behaviour that they have noted within the classroom, therapy or school environment, following occupational therapy intervention within the Snoezelen® room.

What do we expect from the participants in the study? You will be asked to complete an online survey that will require about 15 minutes of your time.

May I withdraw from the study? Certainly, you may do this at any time without having to give a reason. Remember that the study is completely voluntary and not taking part in it, or withdrawing from it, carries no penalty of any sort.

What about confidentiality? Confidentiality will be maintained by the use of a code instead of names on all results. Names will not be asked in order to maintain anonymity.

Please do not hesitate to contact me, on 074 141 1412 or mikaashleysolomon@gmail.com, if you have any queries or require more information

If you are happy to take part in the study, please read and sign the attached consent form.

Thank you,

Mika Solomon

Appendix F: Consent Form

INFORMED CONSENT TO PARTAKE IN THE FOLLOWING STUDY: TEACHERS' AND THERAPIST'S KNOWLEDGE AND PERCEPTION OF THE EFFECTS OF SNOEZELEN® IN OCCUPATIONAL THERAPY TREATMENT.

I confirm that I have been informed by Mika Solomon about the nature of the study. I have also read/it was read to me, and I understood the information sheet and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

Data will be kept for two years if published or six years if not published, after this period the data will be destroyed.

I agree to take part in the abovementioned study.

Name and Surname of Participant	Signature	Date

Person Explaining Informed Consent (Designation): _____

Printed name	Signature	Date

Appendix G: Proof of submission to South African Journal of Occupational Therapy

mikaashleysolomon@gmail.com

From: noreply@sajot.org.za on behalf of Blanche Pretorius <noreply@sajot.org.za>
Sent: Sunday, 24 March 2024 14:53
To: Mika Solomon; Marica Botha
Subject: [SAJOT] Submission Acknowledgement

Hello,

Mika Solomon has submitted the manuscript, "Occupational Therapy in the Snoezelen® Room: Teachers' and Therapists' Knowledge and Perceptions of the Changes in Children's Behaviour and Performance." to South African Journal of Occupational Therapy.

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Blanche Pretorius

South African Journal of Occupational Therapy http://www.sajot.org.za/index.php/sajot

Appendix H: South African Journal of Occupational Therapy Guidelines

This section contains the guidelines which the author followed in relation to the formatting of the research article.

The format of the draft article was obtained from The South African Journal of Occupational Therapy

Therefore, the style and format of the draft article may differ from that of the remainder of this document which follows guidelines according to the University of Witwatersrand.

General guidelines and instructions

- Manuscripts must be submitted via the SAJOT web site (sajot.co.za); the author must retain a copy of the script.
- New authors must submit the title page of the submission to the editor at sajot@otasa.org.za. A username and password will then be provided to enable the author to complete the online article submission. (See Guide to submitting an article online). Users already registered as authors do not need to go through a repeat of the registration process but simply use their existing username and password.
- Users who are having problems with the username and password should contact the Editor-in-Chief at sajot@otasa.org.za.
- Please insert a note in the 'footer' that gives the title of the article and the date at each submission. This is important for tracking purposes and will ensure that the correct version of the script is used. This footnote will be removed at publication.
- Submission of the following separate files needs to be:
    - The Manuscript (scientific article, scientific letter, scoping/systematic review, commentary, opinion piece) including the illustrations, tables, graphs.
    - 4 Supplementary files:
        - A Title page.
        - 15 multiple choice questions (MCQ's) (not for book reviews)
        - Contribution of Authors

- Plagiarism Check report / certificate

The Manuscript

1. The manuscript needs to be uploaded first. This should include the abstract if applicable and all the illustrations, tables, graphs should be included in the correct place within the manuscript.
2. Please include the ethics clearance number if applicable to the ethical clearance certificate must be available if requested. The ethical clearance number must also be recorded in the article when it is submitted for publication as part of the methodology section of the article.

Supplementary files

1. Title Page

Each Manuscript must include a separate Title Page loaded as a Supplementary File. When submitting the article do not include any author information on the article itself.

This page must include:

The title of the article	
For each author	Full name
	All academic degrees and where these were obtained
	Present post held
	Status as undergrad student or postgrad student at time of research and affiliation
	Complete address
	Telephone number
	e-Mail address
	ORCID number
	HPCSA number and OTASA membership number if applicable

	Ethical clearance number and Institution where obtained
	Acknowledgments, sources of funding and conflict of interests

The ORCID number must also be recorded in the relevant place on the SAJOT web site when the article is being submitted using http//: and not https:// on the electronic submission page. To obtain an ORCID reference number and to learn about the benefits of being registered, go to: www.orcid.org . The orchid number will be included as part of the metadata of your article when it goes to publication. Please check that the ORCID number resolves to each of the authors' names.

2. Contribution of the authors

Contribution of the author in the manuscript/research process needs to be described in a separate document to be uploaded as a supplementary file. This is a requirement of SciELO. All listed authors must meet all four the criteria as set out in our Policy Document

3. The Multiple-Choice questions (MCQs)

- For CPD purposes 15 multiple choice questions with the correct answer clearly marked should be set.
- Criteria for the setting of the MCQ content as prescribed by the HPCSA are that they should be
    - clear and concise, reflecting understanding
    - each MCQ question must contain a minimum of three options, and may be
        - multiple choice stem with alternate answers,
        - single-correct answer or single-best formats
        - matching
        - true/ false – maximum 20%
    - should not contain commercial product promotion and/ or satire

4. Plagiarism Check report / certificate

'Cross Ref' or 'Turn-it-in' or 'Authenticate' certificate must be attached with an acceptable level (usually 15% or less depending on the use of terminology in the manuscript)

Referencing

Vancouver style referencing is used and each reference in the text must be indicated by a number in the text. This number should be inserted in superscript without brackets.

e.g.[12]. A reference list should be provided on a separate numbered page following the article text. References must be cited in the order that they appear in the text. Please check references from predatory journals are avoided. Predatory journals can be checked at https://predatoryjournals.com/journals/ or https://beallslist.net/.

ALL references must be linked through CrossRef i.e., each reference must show its DOI number (if it has one). To find the DOI number go to https://search.crossref.org/. A window that askes to copy and paste or type in the title of the article or book and search. The full information on the article will appear. Please note that the DOI reference must be spaced so that it falls on one line and is not split between two lines. See examples of referencing below:

In Mendeley - the *Council of Science Editors – Citation Sequence (numeric)* provides the correct referencing. DOI numbers must be entered with the http://dx.doi.org/ prefix into the Mendeley programme and these need to be linked in the reference list using CNTL K in the reference list. All date of access, URLs and publishers must be removed from Mendeley reference programme for journal articles.

In Endnote - use *Council of Science Editors (CSE*) or *PLOS (you will need to change the style to remove brackets and superscript numbers:* https://libguides.library.cqu.edu.au/c.php?g=760903&p=6317474) to provide the correct referencing. In endnote DOI numbers will also have to be added to references in Endnote with a http://dx.doi.org/ prefix.

Examples of referencing

- Journal article

Format: Author. Article title. Journal. Year; Volume (No): Page numbers. DOI number Barnard-Ashton P, Adams F, Rothberg A, McInerney P. Digital apartheid and the effect of mobile technology during rural fieldwork**.** *South African Journal of Occupational Therapy*. 2018; 48(2): 20-25. doi: http://dx.doi.org/10.17159/23103833/2018/vol48n2a4.
Journal names must be written out in full and italicised. Please note that this format must be used NOT doi:10.17159/23103833/2018/vol48n2a4

- Book

Format: Author(s)**.** Book title. Edition. City: Publisher; Year. DOI if one is available De Vos AS, Strydom H, Fouché CB, Delport CSL. Research at Grass Roots: A primer for the Social Sciences and Human Service Professions. Pretoria: Van Schaik Publishers; 2011. https://doi.org/10.4102/hsag.v2i3.337

- Chapter (Section) in a Book

Format: Author(s). Chapter title. Book title. Editor. City: publisher; Date/Year published: page numbers. DOI number
Amis, M. Silk, M. Eisenhart, M. Freeman, K. deMarrais, J. Preissle, R. Roulston, E. St. Pierre, K. Howe, P. Lather, Y. Lincoln, G. C. In: Annella, D. Polkinghorne & H. Torrance.

Chapter 10, Standards for Evaluating Qualitative Research. In: Understanding and Evaluating Qualitative Educational Research. M Lichtman, Editor. New York: Sage Knowledge; 2011: 253-260.
doi: https://dx.doi.org/10.4135/9781483349435.n10

- Webpages

Format: Author(s)(may be corporation or organisation).Name or title of webpage. the

- date accessed and the URL.

South African Government. Special Needs Education: Education White Paper 6. 2021 [accessed 2021 Jan 12]. https://www.gov.za/documents/special-needs-education- education-white-paper-6

General Requirements

Type of manuscript	Abstract (words)	Pages	Tables and figures	Words (without tables and references)	References
Scientific Articles	200	±16-19	8	5000- 7000	Max 35 for the literature review section. Max 60 references

Manuscripts must be clearly typed in MS Word 1.5 spacing with a legible font (Arial, size 11 is preferable). Set English (South Africa) as the default language. Occupational therapy and occupational therapists should not be capitalised or abbreviated.

If quoting from a reference the following format must be used: Gibson2:30 stated that "Occupational therapy is an important service for the rehabilitation of persons suffering from HIV/AIDS". where 2 is the reference number and 30 is the page number on which the quote appears. All quotes from literature must be in quotation marks " ". Quotes from participants in qualitative research should be in quotation marks *and* italics.

Tables should have the heading at the top of the table and labelled with Roman letters
e.g., Table II.

Figures should be labelled at the bottom of the figure with Arabic numbers e.g., Figure. 2.

Tables and figures (which may include graphs) should not be scanned but formatted and included in place in the manuscript. Figures should be clear to the reader when photocopied.

Figures which consist of illustrations, diagrams or photographs may be of any size. They must be very sharp, taken close-up, and photographs should have a lightish over-all tone and without dark backgrounds. If the photograph, diagram, and illustrations photocopy well, they will print well. Please check this before you send the manuscript.

The following web sites may be helpful for authors to consult either during the research process or during the write up process:

1. Equator Network (http://www.equator-network.org/), a database library that allows you to find and use reporting guidelines for different study designs. Provides a decision tree and examples that assist you with choosing the most appropriate reporting guideline for your study.
2. Typeset (https://www.typeset.io/), an online research communication platform that autoformats documents and helps ensure they are 100% compliant with journal submission guidelines.
3. Authoraid (http://www.authoraid.info/en/), a free global network that provides online mentoring, collaboration, and support for researchers in low and middle-income countries.
4. Standards
   for Reporting Qualitative Research: A Synthesis of Recommendations
   (https://journals.lww.com/academicmedicine/fulltext/2014/09000/standards_for_reporting_qualitative_researcha.21.aspx)

Article processing

Once a manuscript has been submitted, it will be subject to a pre-review desk edit procedure to check whether all criteria as outlined in this document have been met. The outcome of this procedure may be one of the following:

- Accept for peer-review
- Soft reject – author(s) requested to revise the document in line with requirements prior to peer-review.
- Hard reject – not accepted for review.

Peer-Review of submissions

When accepted for review, all manuscripts undergo an anonymous double blind peer review process. The reviewers are required to comment on the scientific worth of the article and its suitability for publication in SAJOT. (To ensure a blind review see section below). The comments and recommendations of each reviewer are returned to the authors by the editor with a directive for further action required. Articles may be accepted without change; changes may be requested, article needs to be revised and sent for a second round of reviews, or the article may be rejected.

Editing

Please note that the article will be checked by the Editor and the English Language editor and when necessary, the author(s) before going to print.

Intellectual Property and Copyright

The author(s) retain(s) intellectual property rights over original material, in keeping with South African IP legislation and the policy of the employing body/training institution where relevant. SAJOT adheres to Creative Commons licensing as follows:

All work is published under a Creative Commons Attribution 4.0 Non-Commercial International Creative Commons (CC-BY-NC – ND 4.0) License. Under this license, authors agree to make articles available to users, without permission or fees, for any lawful, non-commercial purpose. Users may read, copy, or re-use published content provided that the author and original place of publication are properly cited. See http://userguide.sajot.co.za/wp-content/uploads/2019/10/FINALPublication-Ethics- Practice-comments.pdf

Checking the Manuscript before Submission

Confirmation that the following items have been attended to will be required as part of the submission process.

- The submission has not been previously published, nor has it been before another journal for consideration (or an explanation has been provided in Comments to the Editor).
- The submission file is in Microsoft Word file format.

- All references have been checked to see that they comply with the requirements (see References above).
- The text is Arial 11, 5 spaced; employs italics, rather than underlining (except with URL addresses); and all figures, tables have been placed in the text.
- The text adheres to the stylistic and bibliographic requirements outlined above
- The instructions for Ensuring a Blind Review have been
- A colleague has read the article to provide objective peer input, inconsistencies, spelling, and grammar in addition to running a spell-check with English, South Africa as the default setting. Authors for whom English is a second language should have their article edited by a professional English-language editor or editing During the review process, articles may be returned to the author to arrange such a service, if improvements to language and clarity are required.
- 15 Multiple Choice Questions (MCQs) based on the article content are prepared in the supplementary file section of the article submission. In addition, it is advisable to email these to the managing editor at sajot@otasa.org.za . NB The article will not be sent for review until these have been received or posted on the web site.
- The details of all the authors have been included
- Ethical approval for the study has been sought and explained in the article and an approval number is given but the institution where obtained is replaced by XXX to ensure a blind review.
- The title of the article is on the article submission- see Title page
- The abstract has separately been included in the submission block on the webpage and is also included in the article.
- The article has undergone a plagiarism check.
- Permission has been obtained from the co-authors to publish the article and to use their names.
- The relevant acknowledgements have been provided at the end of the
- As a special request the author is asked to provide the names, place of work, and email contact details of two people who they believe have the skills and expertise to review the article.

Ensuring a blind review

To ensure the integrity of the blind peer review of the submission to this journal, every effort is made to prevent the identities of the authors and reviewers from being known to each other.

It is the primarily the duty of the author to remove any possible identification from the text submitted as indicated below. The reviewer is obliged to keep his/her comments/opinions about the article confidential and communicate these only to the editor; should the reviewer have prior knowledge of or involvement with (incidental or otherwise) the author or the article in question, the editor should be informed of the situation and the situation reviewed if needed.

The editor is the only person who has access to all the information about authors and reviewers. Any issues concerning a review / edit/ authorship / copyright etc. about a SAJOT submission must be brought to the attention of the editor directly – the editor is the only person authorised to deal with these issues and will do so in a strictly confidential manner.

This process applies to the authors, editors, and reviewers (who upload documents as part of their review), checking to see that the following steps have been taken regarding the text and the file properties:

- The authors of the document have deleted their names from the text and substituted with "Author". This includes ensuring that the names used in the acknowledgements section have also been substituted with an Names will be inserted just prior to publication.
- With Microsoft Office documents, author identification should also be removed from the properties of the file.

For Microsoft 2010-2019 (Windows):

- Under the File menu select "Info".
- Click on the "Inspect Document"
- Uncheck all the checkboxes except "Document Properties and Personal information".
- Run the document inspector, which will then do a search of the document properties and indicate if any document property fields contain any
- If the document inspector finds that some of the document properties contain information it will notify you and give you the option to "Remove all," which

you will click to remove the document properties and personal information from the document.

CEU points are accredited as follows:

- Principal authors of a scientific article, literature (scoping/systematic/integrative) review: 15 CEUs and co-authors 5 CEUs.
- Principal authors of scientific letters, commentaries, book reviews or opinion pieces: 5 CEU's and co-authors 3 CEU's.

South African Journal of Occupational Therapy Guidelines for Scientific Articles

Articles submitted to the SAJOT must be original and must not have been published elsewhere. Articles should contain new information, add to existing knowledge, resolve controversy, or provoke thought and discussion. The content of the article must justify the length, which should be about 16-19 pages (between 5000- 7000 words).

Authors should consult the article "The pitfalls of "salami slicing": focus on quality not quantity of publications" by Fenseca M. Editage Insights. Nov 4; 2013. https://www.editage.com/insights/the-pitfalls-of-salami-slicing-focus-on-quality-and-not-quantity-of-publications

Abstract and Key Words

The article must be accompanied by an abstract not exceeding 200 words in length. The abstract must contain a succinct structured summary of the study- headings may be used in the abstract (introduction, methodology, results, conclusion). There should be no references or abbreviations in the abstract.

Key words

A list of "key words" which contain words that might be helpful for tracking your article. Try not to 'repeat' key words from the title of the article, as this will limit the search opportunities.

Introduction

This should provide a brief rationale for the study and an outline of the aims or questions. The introduction should present a clear indication of the need for, and purpose addressed by the article. Authors should not assume that the readers know the context in which the article is set. The content needs to be organised in a coherent and logical manner and may require concise descriptions and definitions of terms to elucidate the content as well as the aim of the study. The literature review may be included in the introduction.

Literature Review

A separate review of the relevant literature can be provided. This should be a critical appraisal of the current relevant literature identifying the limitations in the work already conducted on the subject and a rationale for the study. A maximum of 35 references should be included. The aim or objectives of the study should appear at the end of the literature review

Method

The section on research methods should include if appropriate:

- The research design used,
- The population and manner of selecting the population sample,
- The research tools used,
- The method of data collection,
- The methods used to analyse the data including details of the statistical methods, information on validity, reliability, trustworthiness, and credibility.
- Details of the ethical clearance and informed consent must be provided without the name of the institution at this stage (replace name with xxxx)

Results/Findings

The results must be presented in a way that makes them accessible to the readers and are clearly linked to the aims and methods of the research.

Discussion

The discussion should summarise the main findings and explore the reasons for these. New knowledge must be highlighted, and the limitations of the study given. The implications for occupational therapists and or other health professionals/groups/ contexts must be outlined and the contribution that the study makes to the current state of knowledge of the profession/s stated. Limitations must also be discussed.

Conclusion

The conclusion must be brief, drawing the article to a close by relating the results to the aim of the research and indicating the key findings this research has added.

Acknowledgements and conflict of interests

All assistance and funding for the research must be acknowledged and any conflict of interests stated.

Tables and figures

Articles may include up to eight (8) tables or figures and should be numbered and clearly labelled and included in the manuscript in the appropriate place.

Appendix I: Protocol

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

CANDIDATE'S SURNAME: [Please print]	**SOLOMON**	FIRST NAME/S:	**MIKA ASHLEY**	STUDENT NUMBER:	**1030819**

CURRENT QUALIFICATIONS: **BSc (OT)**

TEL: **N/A**	CELL: **0741411412**	E-MAIL: **mikaashleysolomon@gmail.com**	FAX: **N/A**

DEGREE FOR WHICH PROTOCOL IS BEING SUBMITTED: **MSc OT**

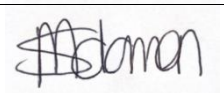
PART-TIME/FULL-TIME: **PART-TIME**	Sex:	F	**X**	M	

DISSERTATION/RESEARCH REPORT: **RESEARCH REPORT**	**50%** contribution towards degree

FIRST REGISTERED FOR THIS DEGREE:	TERM: **1**	YEAR: **2021**

DEPARTMENT: **OCCUPATIONAL THERAPY**

TITLE OF PROPOSED RESEARCH: **TEACHERS' AND THERAPIST'S KNOWLEDGE AND PERCEPTION OF THE EFFECTS OF SNOEZELEN® IN OCCUPATIONAL THERAPY TREATMENT.**

CANDIDATE'S SIGNATURE: 	DATE: **22 JUNE 2021**
SUPERVISOR'S NAME/QUALIFICATIONS: **MARICA BOTHA**	**100% Supervision**

SUPERVISOR'S DEPARTMENT: **OCCUPATIONAL THERAPY**

SUPERVISOR'S ADDRESS / TEL / E-MAIL: **WITS OCCUPATIONAL THERAPY DEPARTMENT, 7 YORK RD., PARKTOWN, JOHANNESBURG, 2193/ 011 717-3701/ MARICA.BOTHA@WITS.AC.ZA**

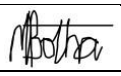
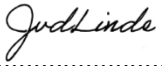
SYNOPSIS OF RESEARCH:
[Use reverse side of this page if more space is required]
SEE OVERLEAF

WITS ETHICS NOT REQUIRED:	Yes	No
WITS ETHICS PENDING:	(Yes)	No
WITS ETHICS APPROVED:	Yes	No
(circle appropriate symbol)*		

***Please note the final human ethics clearance certificate or animal ethics certificate must be available prior to starting research**

IF Y SUPPLY ETHICS CLEARANCE CERTIFICATE AS ATTACHMENT AND INCLUDE ETHICS NUMBER HERE:

As supervisor/s, I/we confirm that I have read the protocol which has been submitted for assessment

SIGNATURE OF SUPERVISOR/S:		
PROTOCOL ACCEPTED BY HEAD OF DEPARTMENT	 ..... SIGNATURE	17/06/2021 ..... DATE
SIGNATURE PG OFFICE STAFF	REGISTERED YES….. NO…..	STAMP

Synopsis of Research

Introduction:

The Snoezelen® room is often used in conjunction with sensory integrative techniques. Many children that experience learning difficulties, also have difficulty with sensory integration. Therefore, it can be deduced that the Snoezelen® room may be of great support in treating sensory integration difficulties within occupational therapy sessions. There has been research that documents the positive outcomes of behaviour whilst in the multisensory environment. However, not much research suggested the notion of skills being carried over from the multisensory environment into the classroom or home environments.

Aim:

The researcher will aim to investigate teachers' and therapists' knowledge and perception of the effects of the Snoezelen® room on children's behaviour and changes on performance, as an occupational therapy modality in a specialised school environment.

Proposed Methodology:

A descriptive quantitative, cross-sectional survey design will be used for the study. It will be completed in three specialised school environments whereby purposive sampling will be used in order to select teachers or therapists that have worked with children who have received intervention in the Snoezelen® room. Once ethical clearance has been received, data will be collected with the use of a survey that has been created for the purpose of this research study.

Expected outcome:

This study is vital in exploring whether changes in performance and behaviour can be noted in classrooms and school environments following occupational therapy intervention in the Snoezelen® room within a specialised school environment, thereby filling the gap in current research by acknowledging whether multisensory environments are significant in contributing to education.

TICK LIST

SCHOOL OF THERAPEUTIC SCIENCES PROTOCOL SUBMISSIONS

The following documents should be submitted with each protocol (hard copy):

	Item	Tick Box
1	Full protocol (1 x Electronic PDF Copy) including all the documents below (submitted to Moodle)	√
1.1	- Front Page (fully completed)	√
1.2	- Front Page Signed by Supervisor	√
1.3	- Front Page Signed by Head of Department	√
1.4	- Front Page Stamped by Postgraduate Office/Proof of Registration	√
2.	Memorandum of Agreement Form – signed by student and supervisor	√
3.	Appointment of Supervisor Form – signed by supervisor/s and Head of Department	√
4.	Plagiarism Form – signed by student	√
5.	Ethics Declaration Form	√
6.	Protocol should not exceed 10 pages (excluding front page, references and appendices)	√

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

PROOF OF REGISTRATION

This document certifies the following information about the student's current status at the University of the Witwatersrand, as at 08-Jan-2021.

The student below is registered from January to December for the academic year 2021.

Student Details:

Student ID	: 1030819	Title	: Miss
Surname	: Solomon		
Name(s)	: Mika Ashley		
Date of Birth	: 27-Dec-1996	ID Number/ Passport Number	: 9612270068086

DATE FIRST REGISTERED: 08-Jan-2021

Programme of Study Details:

Program Code and Title	: MCA11 - Master of Science in Occupational Therapy
Programme Type	: Masters (C) Degree
Attendance Type	: Part-Time
Date of Registration	: 08-Jan-2021
Year of Study	: Year of Study 1

Courses Registered for in 2021:

COURSE	COURSE DESCRIPTION	SESSION	STATUS
OCCT7032A	Occupational Science and Models of Practice	Full Year	Enrolled
OCCT7034A	Research Report I	Full Year	Enrolled
ANAT7011A	General Neuroanatomy	Full Year	Enrolled
OCCT7029A	Research Methodology	Full Year	Enrolled
PHSL7017A	Applied Neurophysiology	Full Year	Enrolled

FACULTY REGISTRAR

Statement of principles for postgraduate supervision

In a context of academic freedom and within a framework of individual autonomy and the pursuit of knowledge, this statement is written in the belief that there is a reciprocal relationship and mutual accountability between supervisor and student

THE SUPERVISOR AND THE STUDENT:

1. Will establish agreed roles and clear processes to be maintained by both parties. In the case of joint supervision, the roles and responsibilities of each supervisor and the student need to be clarified.
2. Will meet regularly and as frequently as is reasonable to ensure steady progress towards the completion of the proposal, research report, dissertation or thesis. This time varies but the normal minimum requirement for face-to-face contact spread across each year of registration is: 10 contact hours for an Honours project, 15 contact hours for a Masters by coursework and research report and 24 contact hours for a Masters by dissertation and a PhD.
3. Will keep appointments, be punctual and respond timeously to messages.
4. Will keep one another informed of any planned vacations or absences as well as changes in his or her personal circumstances that might impact on the work schedule. Unplanned absences or delays should be discussed as soon as possible and arrangements should be made, to catch up lost time.
5. Will ensure that research on animal or human subjects is conducted with prior approval and according to the procedures and the requirements of the relevant Ethics committee.
6. Will both complete Progress Reports on the research project as required/requested by the relevant Faculty Graduate Studies Committee.

THE SUPERVISOR:

1. Undertakes to provide guidance for the student's research project in relation to the design and scope of the project, the relevant literature and information sources, research methods and techniques and methods of data analysis.
2. Will provide guidance at the commensurate NQF level requirements for autonomy and accountability that the student is expected to demonstrate.
3. Has a responsibility to be reasonably accessible to the students.
4. Will be prepared for meetings with the student. This includes being up-to-date on the latest work in his/her area of expertise.
5. Will expect written work as jointly agreed, and will return that work with constructive criticism within a timeframe (a suggestion of 2-4 weeks) jointly agreed at the outset of the research.
6. Will provide advice that can help the student to improve his/her writing. This may include referrals for language training and academic writing. The supervisor will provide guidance on technical aspects of writing such as referencing as well as on discipline specific requirements. Detailed correction of drafts and instruction in aspects of language and style are **not** the responsibility of the supervisor.
7. Will guide the student in the production of a research report, dissertation or thesis. Provision should be allowed for adequate, mutually respectful, discussion around recommendations made.
8. Will assist with the construction of a written time schedule, which outlines the expected completion dates of successive stages of the work.
9. Will encourage the student to present work at postgraduate/ staff seminars/national/international conferences as appropriate.
10. Will assist with the publication of research articles as appropriate.
11. Will discuss the ownership of research conducted by the student in accordance with the University rules on intellectual property, copyright, **guidelines on authorship/co-authorship**, and **policy on research integrity.**
12. Will ensure that the student is aware of the University's Plagiarism Policy, knows what plagiarism is, and what the consequences are for academic dishonesty and violation of research integrity and intellectual property.
13. Will ensure that the student is made aware in writing of the inadequacy of progress and/or of any work where the standard is below par. Acceptability will be according to criteria previously supplied to the student.
14. Has a duty to refuse to allow the submission of sub-standard work for examination, regardless of the circumstances. If the student chooses to submit without the consent of the supervisor, then this should be clearly recorded and the appropriate procedures followed.

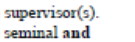
THE STUDENT:

1. Takes full responsibility for the research and its successful completion; including managing the process under the guidance of supervisor (s).
2. Will attend such courses and lectures that are compulsory for the degree, and undertakes to catch up fully on any work, lectures and/or assignments, that are missed.
3. Undertakes to work independently under the guidance of the supervisor(s). This includes reading widely and critically to ensure that the seminal **and** current literature pertinent to his/her chosen topic has been identified, consulted and critiqued.
4. Undertakes to work in accordance with the academic standards expected by the University for the commensurate NQF level of qualification.
5. Is obliged to make appointments to consult the supervisor(s) and arrange meeting times convenient to both parties well in advance.
6. Should submit written work for discussion with the supervisor(s) well in advance of a scheduled meeting. The kind and frequency of written work should be agreed with the supervisor(s) at the outset of the research.
7. Written work that is submitted to the supervisor, including final submissions to examiners, should be relatively free from basic spelling mistakes, incorrect punctuation and grammatical errors. Responsibility for the accuracy of language, the overall structure and coherence of the final research report, dissertation or thesis rests with the student.
8. Cannot expect the supervisor to be proof-reader and editor of his/her work or to approve work with any of the weaknesses spelt out in 7 above.
9. Undertakes to heed the advice given by the supervisor(s) and to engage in discussion around suggestions made. Ultimately the student has to take responsibility for the quality, integrity and presentation of the work.
10. Should strive to maintain a focus on his/her research area and to work diligently within the agreed time schedule.
11. Agrees to honour agreements about ownership of the research and in accordance with the University's guidelines and rules in relation to co-authorship, copyright and intellectual property.
12. Will ensure that the work contains no instances of plagiarism, violation of intellectual property and research integrity standards, that all citations are properly referenced, and that the list of references is accurate, complete and consistent.
13. Agrees to work in accordance with the criteria of acceptability as supplied by the supervisor(s).
14. Undertakes not to place the supervisor(s) under undue pressure to submit work for examination until the supervisor is satisfied that it has reached an acceptable, **examinable*** level of quality.

We confirm that we have read and understood this statement and agree to be guided by its principles for as long as we continue to work together.

Name of student: **MIKA SOLOMON**

Student Number: **1030819**

Student's signature: 

Name of Supervisor: **MARICA BOTHA**

Supervisor's signature: 

Name of Co-Supervisor: _____

Co-Supervisor's signature: _____

The broad area of study is: **PAEDIATRICS**

Provisional submission date is: **22 JUNE 2021**

Degree: **MSc (OT)**
School: **OCCUPATIONAL THERAPY**
Faculty: **HEALTH SCIENCES**

Date: **28 MAY 2021**

Specific agreements pertaining to: ownership, joint publication, funding, confidentiality and disclosures pertinent to the Certificate of Clearance and ETD Form which the student and/or supervisor are required to sign, must be attached to this agreement as and when appropriate and kept in the Faculty Office. In the event of disagreements between the supervisor(s) and student, the parties should act in accordance with the University Grievance Policy.

***Note: Consent by supervisor**(s) to submit work for examination does NOT guarantee that the work will pass. The appointed examiners assess and determine whether the work is of a passable standard.

(2019/09/30)

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG | FACULTY OF HEALTH SCIENCES

RECOMMENDATION FOR APPOINTMENT OF SUPERVISOR(S) OF RESEARCH REPORT, DISSERTATION OR THESIS

Motivation / Reason for Appointment:
Supervisor is expert in sensory integration and the study is in the field of sensory integration.

Recommendation of Division / Department / School:
Masters in Occupational Therapy Coursework and Research/ Occupational Therapy Department/ Faculty of Health Science

Student Surname and Full name(s)	**MIKA SOLOMON**
Student number	**1030819**
Degree	**BSc (OT)**
Div / Dept / School	**DEPARTMENT OF OCCUPATIONAL THERAPY**
Title	**TEACHERS' AND THERAPIST'S KNOWLEDGE AND PERCEPTION OF THE EFFECTS OF SNOEZELEN® IN OCCUPATIONAL THERAPY TREATMENT.**

(Supervisor 1): Marica Botha
(Name &Surname)

Supervision %: 100%

Supervisor Qualifications: MSc. Occupational Therapy (WITS)

Supervisor Department: Department of Occupational Therapy

Supervisor Telephone: 082 335 6386 E-mail: marica.botha@wits.ac.za

Supervisor 2: _____
(Name &Surname)

Supervision %: _____

Supervisor Qualifications: _____

Supervisor Department: _____

Supervisor Telephone: _____ E-mail: _____

Student Signature: _____

Supervisor 3: _____
(Name &Surname)

Supervision %: _____

Supervisor Qualifications: _____

Supervisor Department: _____

Supervisor Telephone: _____ E-mail: _____

Student Signature: _____

Supervisor 1 Signature: 

Supervisor 2 Signature: _____

Supervisor 3 Signature: _____

RECOMMENDATION BY HEAD OF DIVISION / DEPARTMENT / SCHOOL:

Dr. Janine van der Linde		17/06/2021
(Full name(s) and Surname)	(Sign)	(Date)

APPROVAL BY CHAIR OF ASSESSOR GROUP:
(On behalf of the FGSC)

(Full name(s) and Surname)	(Sign)	(Date)

PLEASE NOTE: RECOMMENDATION FOR APPOINTMENT OF SUPERVISOR(S) FOR CIRCULATION TO THE FGSC FOR APPROVAL

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

University of the Witwatersrand Student Ethics Declaration Form

(To be completed during the protocol assessor meeting)

Background

All Research conducted by a University of the Witwatersrand student, with human subjects or animals, requires approval by the Wits Human Research Ethics Committee or Animal Research Ethics Committee, respectively.

If research has been undertaken without the necessary ethics approvals, this is considered an ethics violation. This will be reported to the relevant structures, the data will have to be discarded, and in the case of students, they cannot use the data towards their degree.

To prevent any ethics violations, the ethics requirements for the proposed project will be discussed with you at the protocol assessment.

Declaration

Based on the current protocol assessment (and any proposed changes suggested by the assessor committee), we, the undersigned, understand that the proposed research requires:

1. Human Research Ethics clearance certificate	~~Yes~~	No
a. Covered under existing supervisor ethics	Yes	~~No~~
b. Requires a new HREC application	~~Yes~~	No
2. Animal Research Ethics clearance certificate	Yes	~~No~~
3. No Human or Animal Ethics Clearance	Yes	~~No~~
4. Unclear, will seek appropriate guidance from the HREC/AREC committees (whichever relevant)	Yes	~~No~~

Signatures

Supervisor/s: _____ Student: _____

Date: 28 MAY 2021

2021

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I **MIKA SOLOMON** (Student number: **1030819**) am a student registered for the degree of **MSc (OT)** in the academic year **2021.**

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.
- I have read the University of the Witwatersrand policy on plagiarism and I understand the consequences of plagiarism.

Signature:  Date: **28 MAY 2021**

Faculty of Health Sciences, Postgraduate Office
Phillip Tobias V Building, 2nd Floor
Cnr York & Princess of Wales Terrace, Parktown 2193
Tel: (011) 717 2745 | Fax: (011) 717 2119
Email: Mathoto.senamela@wits.ac.za

STATEMENT OF PRINCIPLES FOR POSTGRADUATE SUPERVISION

IN A CONTEXT OF ACADEMIC FREEDOM AND WITHIN A FRAMEWORK OF INDIVIDUAL AUTONOMY AND THE PURSUIT OF KNOWLEDGE THIS STATEMENT IS WRITTEN IN THE BELIEF THAT THERE IS A RECIPROCAL RELATIONSHIP AND MUTUAL ACCOUNTABILITY BETWEEN SUPERVISOR AND STUDENT.

THE SUPERVISOR AND THE STUDENT:

1. Will establish agreed roles and clear processes to be maintained by both parties. In the case of join supervision everybody's role needs to be clarified.
2. Will meet regularly and as frequent as is reasonable to ensure steady progress towards the completion of the proposal, research report, or dissertation or thesis. This time varies but the normal minimum requirement for face-to-face contact spread across each year of registration is: 10 contact hours for an Honours project, 15 contact hours for a Masters by a research report and 24 contact hours for a Masters by dissertation and a PhD.
3. Will keep appointments, be punctual and respond timeously to messages.
4. Will keep one another informed of any planned vacations or absences as well as changes in his/her personal circumstances that might impact on the work schedule. Unplanned absences or delays should be discussed as soon as possible and arrangements should be made, to catch up lost time.
5. Will ensure that research on animal or human subjects is concluded according to the procedures and the requirements of the relevant University Ethics committee.
6. Will together complete progress reports on the research project, as requested by each Faculty Graduate Studies Committee.

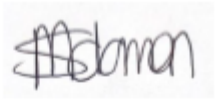
THE SUPERVISOR

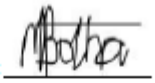
1. Undertakes to provide guidance for the student's research project in relation to the design and scope of the project, the relevant literature and information sources, research methods of data analysis.
2. Has a responsibility to be accessible to the students.
3. Will be prepared for the meeting with the student. This includes being up-to-date on the latest work in his/her area of expertise.
4. Will expect written work as jointly agreed, and will return that work with constructive criticism within a timeframe (a suggestion of 2-4 weeks) jointly agreed at the outset of the research.
5. Will provide advice that can help the student to improve his/her writing. This may include referrals for language training and academic writing. The supervisor will provide guidance on technical aspects of writing such as referencing as well as on the discipline specific requirements. Detailed correction of drafts and instruction in aspects of language and style are not the responsibility of the supervisor.
6. Will support the student in the production of a research report, dissertation or thesis. Provision should be allowed for adequate, mutually respectful, discussion around recommendations made.

7. Will assist with the construction of a written time schedule, which outlines the expected completion dates of successive stages of the work.
8. Will ensure the student has the opportunity to present work at postgraduate/staff seminars/national/international conferences as appropriate.
9. Will assist with the publication of research articles appropriate.
10. Will discuss the ownership of research conducted by the student in accordance with the University guidelines and rules on intellectual property, co-authorship and copyright.
11. Will ensure that the research is conducted in accordance with the University's policy on plagiarism.
12. Will ensure that the student is made aware in writing of the inadequacy of progress and/or of any work where the standard is below par. Acceptability will be according to criteria previously supplied to the student.
13. Has a duty to refuse to allow the submission of sub-standard work for examination, regardless of the circumstances. If the student chooses to submit without the consent of the supervisor, then this should be clearly recorded and the appropriate procedures followed.

THE STUDENT

1. Undertakes to work independently under the guidance of the supervisor. This includes reading widely to ensure that the literature pertinent to his/her chosen topic has been identified and consulted.
2. Is obliged to make appointments to see the supervisor and will arrange meeting times well in advance.
3. Will think carefully about how to get maximum benefit from these contact sessions by planning what s/he wants in these sessions.
4. Should submit written work for discussion with the supervisor well in advance of a scheduled meeting. The kind and frequency of written work should be agreed with the supervisor at the outset of the research.
5. Written work that is submitted should be relatively free from basic spelling mistakes, incorrect punctuation and grammatical errors. Responsibility for the accuracy of language, the overall structure and coherence of the final research report, dissertation or thesis rests with the student.
6. Undertakes to heed the advice given by the supervisor and to engage in discussion around suggestions made. Ultimately the student has to take responsibility for the quality and presentation of the work.
7. Should strive, within reasonable bounds, to maintain a focus on his/her research area and to work within the agreed time schedule.
8. Will prepare material for presentations at seminars and conferences.
9. Undertakes to submit papers for publication.
10. Agrees to honour agreements about ownership of the research and in accordance with the University's guidelines and rules in relation to co-authorship, copyright and intellectual property.
11. Will ensure that the work contains no instances of plagiarism and that all citations are properly referenced and that the list of references is accurate, complete and consistent.
12. Agrees to work in accordance with the criteria of acceptability as supplied by the supervisor.
13. Undertakes not to place the supervisor under undue pressure to submit work for examination until the supervisor is satisfied that it has reached an acceptable level of quality. We confirm that we have read and understood this statement and agree to be guided by its principles for as long as we continue to work together.

Name of student: MIKA SOLOMON Student's signature: 

Name of Supervisor: Marica Botha Supervisor's signature: 

Name of Co-Supervisor: _____ Co-Supervisor's signature: _____

The broad area of study is: PAEDIATRICS AND SENSORY INTEGRATION

Provisional submission date is: JULY 2021 Degree: MSC (OT)

School: OCCUPATIONAL THERAPY Faculty: HEALTH SCIENCES

Date: 11 APRIL 2021

Specific agreement pertaining to: ownership and joint publication, funding, may be attached and signed.

GRIEVANCE PROCEDURES: It should be acknowledged that during the course of the research that both students and supervisors can feel aggrieved. In this event, these should be dealt with as swiftly as possible by the parties involved and, if necessary, the Postgraduate Coordinators and Committees. There is, in addition, a University Grievance Policy to help guide deliberations.

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Background and Need for the Study

Introduction

The Snoezelen® room was initially developed in the early 1970s by therapists who worked at an institution for people with disabilities (McKee *et al.*, 2007). Snoezelen® is the trademark name for a specific type of multisensory environment (MSE). A Snoezelen® environment can be described as a safe and non-threatening room where individuals are encouraged to explore the equipment in the environment. This is done in order to stimulate senses of hearing, vision and touch, as well as vestibular and proprioceptive sensation (Botts, Hershfeldt and Christensen-Sandfort, 2008b). As such, the concept of Snoezelen® rooms was introduced in the form of a specifically designed room to encourage exploration of the quantity, nature, intensity and arrangement of sensory stimuli (Nasser *et al.*, 2004b). The nature of Snoezelen® thus inherently allows for client-centred care. Initially the sole purpose of Snoezelen® was to provide relaxation and leisure time (McKee *et al.*, 2007). The focus later shifted and there was an increased interest in making use of Snoezelen® as treatment for more serious difficulties, such as brain injury and dementia but recently, there has been discussion about the use of Snoezelen® within schools. Occupational therapists commonly work in specialised schools or other schools where children perhaps experience learning difficulties. Learning disabilities are defined as “unexpected, significant difficulties in academic achievement and related areas of learning and behaviour” (4). Many professionals that provide intervention within the Snoezelen® room, have chosen to make use of it in such a way that additional educational and therapeutic aims can be met (Hogg *et al.*, 2001b). Occupational therapists also make use of the Snoezelen® room in conjunction with Ayres Sensory Integration® (ASI), which ensures that controlled sensory stimulation is provided (Roley *et al.*, 2007b).

There has been much research that documents the positive outcomes of behaviour due to the multisensory environment. Examples of positive outcomes include behavioural enhancement, reduced levels of pain, a balance of heart rate, calming effects and increased motivation (Shapiro *et al.*, 2009b; Stephenson and Carter, 2011b). In a study completed by Stephenson and Carter (Stephenson and Carter, 2011b), teachers’ perceptions of the use of the MSE in schools was explored. Many teachers agreed that the MSE allows for children to receive an opportunity to focus on specific tasks, whilst being free of distraction. However, not many teachers suggested the notion of skills being carried over from the MSE into the classroom environment or other environments like the home (Stephenson and Carter, 2011b). Thus, there is no

evidence that changes in children's behaviour noted within the Snoezelen® room, is transferred into the classroom or school environment.

Problem Statement

While there is an indication that children's behaviour might change positively during occupational therapy intervention whilst they are actually in a multisensory environment (MSE), there seems to be no evidence that these positive changes in behaviour are continued when the child returns to external environments, such as the classroom or school environment (Stephenson and Carter, 2011b). Thus, there is a need to explore whether changes in performance and behaviour can be noted in classrooms and school environments, after occupational therapy intervention is given within the MSE (Stephenson and Carter, 2011b).

Research Question

What are the perceptions of teachers and therapists regarding the aftereffects of occupational therapy within the Snoezelen® room in a specialised school environment?

Aim of the Study

The researcher will aim to investigate teachers' and therapists' knowledge and perception of the effects of the Snoezelen® room on children's behaviour and changes in performance, as an occupational therapy modality in a specialised school environment.

Objectives of the Study

- To determine teachers' and therapist's knowledge of the Snoezelen® room.
- To determine teachers' and therapist's perceptions of the effect of occupational therapy in the Snoezelen® room with regards to changes in children's level of arousal carried over into the classroom/therapy environment.
- To determine teachers' and therapist's perceptions of the effect of occupational therapy in the Snoezelen® room with regards to changes in children's behaviour carried over into the classroom/therapy environment.
- To determine teachers' and therapist's perceptions of the effect of occupational therapy in the Snoezelen® room with regards to changes in children's scholastic performance in the classroom/therapy environment.

Significance of the Study

Multisensory environments (MSE), specifically Snoezelen® rooms, have become a relatively well-known benefit to therapeutic interventions that use a sensory integrative frame of reference. Research has been done surrounding the positive effects on

behaviour within the MSE, however there has been little research done on the transfer of these changes of behaviour into other environments, such as the school environment (Lin et al., 2012b). It is important that the transfer of knowledge, skills, and behaviour from the MSE into the classroom environment be explored to validate the benefit of having a MSE within school environments. This study aims to review teacher's and therapists' perceptions of the use of the MSE by having them identify changes in behaviour that they have noted within the classroom, therapy or general school environment, following occupational therapy intervention within the Snoezelen® room**.**

The information gained from this study will give insight into behavioural and performance changes following occupational therapy treatment in the Snoezelen® room. Should this type of intervention show positive behavioural and performance changes within a classroom and school environment, the Snoezelen® room may be seen as a necessary and useful addition to make use of in schools.

Literature Review

Occupational Therapy in Specialised Schools

It is known that occupational therapists focus on a wide range of occupational performance areas, one of them being education. For a child who has minor learning disabilities, initial signs of difficulty may only appear at a school going age when his or her performance does not meet the teacher's expectations (O-Brian and Kuhaneck, 2020). These difficulties arise from differences in the neurological structure of the brain and its function which impact one's ability to store, receive and process incoming information (Cortiella and Horowitz, 2014b). The goal of occupational therapy within a school environment is to assist children in areas such as class work, play, social engagement, leisure and activities of daily living (Boop *et al.*, 2020). Commonly, another important area of focus is the child's sensory processing. Jean Ayres brought about the idea that children with learning difficulties may also experience neurological dysfunction with regards to their ability to process sensory information (Leong, Carter and Stephenson, 2015b). Thus, in order to address this dysfunction, Ayres developed a method of intervention called Ayres Sensory Integration® (ASI) which ensures that controlled sensory stimulation is provided (Roley *et al.*, 2007b). It aims to promote improvement of higher order skills such as language, academic skills and motor coordination (Leong, Carter and Stephenson, 2015b). These skills are seen to be connected to neurological pathways in the brain that are responsible for integrating sensory information. The main goal of ASI is to change the way in which the brain

modulates and organises incoming sensory information. ASI is however a very specific way in which to provide sensory integrative therapy, and not all sensory therapy is regarded as ASI. Snoezelen® is not regarded as pure ASI therapy and will thus be referred to as sensory integration therapy (SIT) (Parham *et al.*, 2011). Therefore, it is beneficial to make use of SIT in school-based occupational therapy intervention, as these aims can be more readily met in younger children whose brains can still adapt due to neuroplasticity (Leong, Carter and Stephenson, 2015b).

The Snoezelen® room

The word Snoezelen® itself carries meaning from a combination of two words, namely snuffelen which is 'sniffing' and doezelen which is 'dozing' (H. W. M. Kwok, To and Sung, 2003b). These words allude to an environment allowing for relaxation paired with a pleasurable sensory aspect (Lotan and Gold, 2009b). Individuals are encouraged to explore the equipment in the environment in order to stimulate senses of vision, hearing, smell and touch, as well as proprioception and vestibular sensation (Botts, Hershfeldt and Christensen-Sandfort, 2008b). Each Snoezelen® room differs in context however most include components of each sensory modality that can be explored within its safe and relaxing environment, that reduces the notion of external emotional or physical pressure that might be experienced in other demanding environments (Botts, Hershfeldt and Christensen-Sandfort, 2008b). In fact, there are no windows in the Snoezelen® room in order to reduce stimuli from the external environment. Thus, making this room more inviting to an individual who experiences sensory overload (Hindi-Alexander, 1978). Although there is no set standard for the equipment found in the Snoezelen® room, equipment that is often found can include white coloured equipment, mirror balls, bubble tubes, coloured lights, lava lamps, music and fibre-optic cables, all of which can be controlled by the individual to meet their sensory needs (Shapiro *et al.*, 2009b). Some benefits of the Snoezelen® room include: development of self-confidence, promoting choice, improving attention, reducing challenging behaviours, relaxation and encouraging exploration (H. W. M. Kwok, To and Sung, 2003b).

Existing knowledge about the Snoezelen® room in school environments.

There has been much research that documents the positive outcomes of behaviour due to the multisensory environment such as behavioural enhancement, reduced levels of pain, a balance of heart rate, calming effects and increased motivation (Shapiro *et al.*, 2009b; Stephenson and Carter, 2011b). There has also been evidence that the Snoezelen® room may impact a child's level of arousal, which can be depicted

in a change in behaviour where there is an increase or decrease of relaxation and emotions (Hogg *et al.*, 2001b). More recently, Botts et al. (Botts, Hershfeldt and Christensen-Sandfort, 2008b) conducted a study to delve into these effects, however only two studies that included children were found. Chan et al. (Chan *et al.*, 2005b) found an increase in children's positive emotions following intervention in the Snoezelen® room however no change in aggression or adaptive behaviours were found (Chan *et al.*, 2005b). Shapiro et al. (Shapiro *et al.*, 1997b) found that a child's behaviour seemed to be more adaptive in the Snoezelen® room in comparison to a playroom (Shapiro *et al.*, 1997b). In a study completed by Stephenson and Carter (2), teachers' perceptions of the use of the MSE in schools was explored. When MSE's started appearing in school environments, there was a shift in their purpose from being a leisure experience to a space that can be used for teaching. This study was carried out as there is not enough research on the outcomes of the Snoezelen® room especially in relation to children, as can be seen above (Stephenson and Carter, 2011b). Many teachers agreed that the MSE allows for children to receive an opportunity to focus on specific tasks, whilst being free of distraction. However, not many teachers suggested the notion of skills being carried over from the MSE into the classroom environment or other environments like the home, which is a vital component to explore if MSEs are to become significant in contributing to education (Stephenson and Carter, 2011b).

Occupational therapy and Sensory Integration in the Snoezelen® room

Snoezelen®, being a multisensory environment, is specifically equipped to allow for the nature and quantity of stimulation to be controlled by the participant who is making use of the room (Lotan and Gold, 2009b). Similarly, sensory integration therapy aims to be child-directed (Lin *et al.*, 2012b). The participant therefore has choice in the sensory stimulation they receive, whether it be visual, auditory, or tactile modalities, in order to impact the outcome of their behaviour. There has been an emergence of the term "the sensory curriculum" which can be naturally associated with Snoezelen® (5). Thus, the Snoezelen® room is often used in conjunction with sensory integrative techniques. Sensory integrative dysfunction can cause hyperactivity, difficulty remaining in one position for long periods of time, reduced ability to concentrate on important stimuli and increased responsiveness to irrelevant stimuli in the environment (Lin *et al.*, 2012b). All these factors negatively affect a child's capability to participate in classroom activities. These factors can also be addressed in occupational therapy intervention and are often addressed through the use of sensory integrative techniques. Many

children that experience learning difficulties, also have difficulty with sensory integration, to which a few or many of their learning difficulties can be associated with. About 90% of American occupational therapists practicing within school environments use principles of ASI in their treatment sessions with children with learning difficulties (May-Benson and Koomar, 2010c). Therefore, it can be deduced that the Snoezelen® room may be of great support in treating sensory integration difficulties within occupational therapy sessions.

Methodology

Study Design

This research study is a descriptive quantitative, cross-sectional survey design study (Kielhofner, 2006b). Descriptive studies are often made use of in occupational therapy and can be exploratory in nature as they allow for a better understanding of current concepts which can then be further examined through more intensive research studies (Kielhofner, 2006b). This type of research makes use of already available information and allows for generation of new understandings through, in this case, surveys. Thus, the study will be a quantitative type of research as it will make use of a survey to collect data in a numerical form. Quantitative methods are useful in gaining more accurate and consistent results. This is done by allocating numbers to variables to quantify a specific characteristic. In this case numbers will be assigned to levels of changes in behaviour (Kielhofner, 2006b). Although it can be difficult to measure people's perceptions due to the fact that they depend on self-reports, it is common to make use of Likert-scales, to estimate these concepts. Likert scales are one of the most common psychometric scales for investigating self-reported perceptions within a quantitative study (Ho, 2017). A cross-sectional design will be used as it assists in exploring the relationship between a health outcome and other variables (Kielhofner, 2006b). In this case, the relationship between intervention in the Snoezelen® room and children's behaviour. This design is beneficial in providing an overview of a certain population (Kielhofner, 2006b). A survey design will allow the researcher to send out the survey to participants via the online Research Electronic Data Capture platform (REDcap) in order to maintain anonymity. The survey design also allows the researcher to analyse multiple variables using statistical methods such as graphs and tables.

Data Collection

Research Context

The research will take place in the context of three school environments in Johannesburg, South Africa namely Bellavista School, King David Ariel and Mohato school. There is a Snoezelen® room available on all of these school's campuses. These schools are specialised schools for children with a range of learning difficulties.

Research Participants/Population

The participants involved in the study will be primary school staff members which include teachers as well as occupational therapists, speech and language therapists, physiotherapists, remedial therapists, social workers, and psychologists.

Sampling Method and Eligibility Criteria

The sampling will be purposive as the sample of individuals will be specifically chosen based on predetermined criteria. This will allow for collection of only relevant information (Kielhofner, 2006b). In the case of this research study, only teachers and therapists who work at schools that have access to a Snoezelen® room will form part of the research population as the research question is based on effects of occupational therapy intervention within the Snoezelen® room, on children's behaviour and changes on performance. A total sample of teachers and therapists working at three specialised primary schools will be used in this study. This amounts to 60 participants. The inclusion criteria for this study are as follows:

- Staff of a primary school for learners with learning difficulties that are a teacher or therapist by profession.
- Staff meeting the previous inclusion criteria that work with children who have received intervention in the Snoezelen® room.

Methods/Instruments and Procedure for Data Collection

Data collection procedure:

A survey (Appendix A) based on current literature will be developed and placed on the REDcap platform. The survey will consist of several questions in which numbers are allocated to certain changes in behaviour. The survey will make use of 'yes' and 'no' questions and well as Likert scales in order to interpret these answers in terms of percentages based on the numerical value assigned to it.

Data collection will only commence once ethical clearance from the Human Research Ethics Committee (Medical) at the University of the Witwatersrand and approval from the Gauteng Department of Education is obtained.

Once this has been received, the head person of the three schools with a Snoezelen® room on their campus will be contacted. Once their permission to partake in the study

is obtained via email, information sheets (Appendix B) and permission forms (Appendix C) and will be sent via email to the head person of each school. The forms will consist of a study information sheet, consent information, and self-developed questionnaire.

Once the questionnaire is deemed valid, the head person of each school will be sent a survey link and asked to share it with each teacher and therapist employed at their school. There will be an 'agree' button for the participants to click once they have read and understood the information sheet, and this will imply that they have given consent. All the surveys that have been completed by a certain date will be used in the study. The results based on the data received from these surveys will be complied and analysed in the form of graphs and tables.

Data Collection Instrument

In the case of this research study, there have been no previous surveys or instruments developed that can be used to measure teacher's and therapists' perceptions of the effects of the Snoezelen® room. Therefore, a survey has to be created as a method of data collection (Kielhofner, 2006b). The content validity of this self-developed questionnaire will be determined by a panel of experts, prior to data collection, to check the appropriateness of the questions. This will be done through a content validity measure.

The self-developed survey will consist of four sections. The first section will include background information and questions surrounding teachers' and therapist's existing knowledge about the Snoezelen® room. The next three sections expand on different areas of functioning namely 'level of arousal', 'changes in behaviour' and 'scholastic performance'. Outcomes that fall within each category will be explored to determine whether or not changes within these areas are exhibited following intervention in the Snoezelen® room.

Data Management and analysis

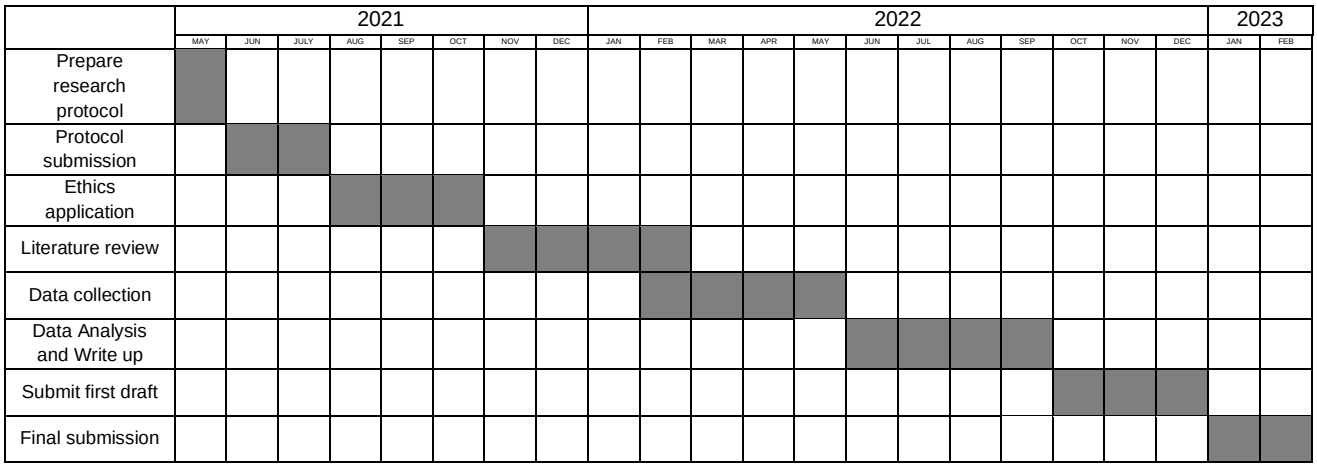
Data obtained from this research study will be entered into an Excel spreadsheet using numbers to correspond to participants. The researcher will make use of descriptive statistics to describe the samples frequencies and ranges. The data will be organised and summarized into graphs, summary tables and charts showing percentages for the information to be more readily understood. The data will be stored safely on a password protected device for a five-year period following the research study.

Ethical Considerations

Ethical clearance will be applied for from the University of the Witwatersrand Human Research Ethics Committee. Approval will also be obtained from the Gauteng

Department of Education before data collection commences. Informed consent from each school will be obtained in the form of written consent (Appendix C). There will be no usage of confidential and private information that might allow for identification of a participant after the results have been obtained. The participants will be kept anonymous by assigning a number to each participant, as their names will not be asked. When processing and releasing the results, only these research numbers will be used. The participants will be given full disclosure of the aims of the study and the conditions of their participation by means of an information sheet (Appendix B). Participation is voluntary and participants can terminate involvement in the research without any consequences and at any given time. Following the study, the participants will also be given the opportunity to obtain further information about the conclusions and results of the study, should they wish to.

Time Frame of the Project



Budget

A minimal budget is needed for this research study as all data collection will remain online, thus paper will not be printed. REDcap is free of charge to students in the University of Witwatersrand Health Science Faculty. Participants can take part in this study at a time and place suitable to them, thus there is no need for transport budget. Budget will be required for telephone calls to heads of schools in order to set up a meeting as well as internet usage for REDcap, this will be funded privately.

Item	Cost	Amount needed	Total
REDcap	R0.00		R0.00
Internet Fees for REDcap use	R39.00 for 1GB per hour	5 hours	R195.00
Telephone calls	R5.00 for 5 minutes	3 calls	R15.00
		Total:	R210.00

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Appendices

Appendix A: Survey

TEACHERS' AND THERAPIST'S KNOWLEDGE AND PERCEPTION OF THE EFFECTS OF SNOEZELEN® IN OCCUPATIONAL THERAPY TREATMENT.

1. Gender:

   _____

2. Age:

   _____

3. Select your profession:

Teacher		Psychologist	
Occupational Therapist		Social Worker	
Speech and Language Therapist		Remedial Therapist	
Physiotherapist		Other	

4. Indicate how many years you have been teaching or giving therapy:

   _____

5. What grades do you teach or give therapy to?

Grade R		Grade 4	
Grade 1		Grade 5	
Grade 2		Grade 6	
Grade 3		Grade 7	

6. How many years have you known about the Snoezelen® room?

   _____

7. How many years have you taught or given therapy to children who receive intervention in the Snoezelen® room?

   _____

8. What do you think the benefits of occupational therapy in the Snoezelen® room are? Please select from the list below.

Calming		Improving language	
Self-regulation		Sensory regulation	
Relaxation		Emotional regulation	
Improving motor skills		Fun and play/leisure	
Improve social participation		Pain management	
Reduce challenging behaviour		Improve attention span	
Provide coping strategies		Improve anxiety levels	
Improve scholastic skills		Assist in reaching therapy goals	
Improve visual perceptual skills		Develop self-confidence	
Achieve a sense of self control		Establish rapport with therapists	
Promote choice		Encourage exploration	
Increase motivation for learning		Decrease aggression	

9. Which age groups do you think are suitable for intervention in the Snoezelen® room?

0 – 12 months		19 – 25 years	
13 months – 6 years		26 years and older	
7 – 12 years			
13 - 18 years			

10. Which type of diagnosis do you think are suitable for intervention in the Snoezelen® room?

ADHD		Cerebral Palsy	
ASD		Down Syndrome	
Dyslexia		Learning difficulties	
Sensory integration dysfunction/Sensory processing disorder		Emotional difficulties	
Speech related difficulties		Other	

LEVEL OF AROUSAL

The table below relates to questions 11-13. Please read the comments to assist in your understanding of the term **'level of arousal'.**

SLOW (LOW)	JUST RIGHT	FAST (HIGH)
The slow speed is often described as sluggish or spaced out.	The just right speed is when it is easy to focus, learn and play.	The fast speed can be described as over-excited, hyper, or out of control.
The child may appear to not be listening or is unable to stay on task.	*The child can maintain appropriate attention to tasks and appears to be learning and problem solving through his work, requiring minimal support.*	*The child may present with an inability to remain seated, difficulty concentrating and moving quickly between activities. The child will have trouble attending to tasks and remaining focused.*

Adapted from The Alert Program®

11. Please indicate on the scale to which degree you find occupational therapy in the Snoezelen® room effective in improving a child's **level of arousal:**

Not at all effective	Very little effect	Somewhat effective	Very effective
1	2	3	4

12. Please use the rating scales to describe your observations on changes in a child's **level of arousal** that you observe following their OT intervention in the Snoezelen® room.

	ON WHICH LEVEL OF AROUSAL DO THE CHILDREN APPEAR FOLLOWING OT IN THE SNOEZELEN ROOM?			HOW OFTEN IS THIS LEVEL OF AROUSAL NOTED FOLLOWING OT IN THE SNOEZELEN ROOM?			FOR HOW LONG IS THIS LEVEL OF AROUSAL NOTED FOR FOLLOWING OT IN THE SNOEZELEN ROOM?		
	Slow	Just right	Fast	Never	Some-times	Always	Minutes	Hours	Days
Level of arousal	1	2	3	1	2	3	1	2	3

13. Do you have any additional comments about changes in a child's **level of arousal** following intervention in the Snoezelen® room?

_____

BEHAVIOUR

14. Please indicate on the scale to which degree you find occupational therapy in the Snoezelen® room effective in improving a child's **behaviour**:

Not at all effective	Very little effect	Somewhat effective	Very effective
1	2	3	4

15. Please use the rating scales to describe your observations on changes in a child's **behaviour** that you observe following their OT intervention in the Snoezelen® room.

	IN WHAT WAY DOES A CHILD'S BEHAVIOUR CHANGE FOLLOWING OT IN THE SNOEZELEN ROOM?			HOW OFTEN IS THIS CHANGE NOTED FOLLOWING OT IN THE SNOEZELEN ROOM?			FOR HOW LONG ARE THESE CHANGES PRESENT FOLLOWING OT IN THE SNOEZELEN ROOM?		
	Becomes worse	Stays the same	Improves	Never	Some-times	Always	Minutes	Hours	Days
Seated position	1	2	3	1	2	3	1	2	3
Chattiness	1	2	3	1	2	3	1	2	3
Attention/focus	1	2	3	1	2	3	1	2	3
Constant movement/fidgeting	1	2	3	1	2	3	1	2	3
Shouting out of answers	1	2	3	1	2	3	1	2	3
Requiring assistance/neediness	1	2	3	1	2	3	1	2	3
Impulsivity	1	2	3	1	2	3	1	2	3
Remaining seated	1	2	3	1	2	3	1	2	3
Self-confidence	1	2	3	1	2	3	1	2	3
Complaints about body aches/headaches	1	2	3	1	2	3	1	2	3
Mood	1	2	3	1	2	3	1	2	3
Cooperation/engagement	1	2	3	1	2	3	1	2	3
Withdrawal	1	2	3	1	2	3	1	2	3
Anxiety	1	2	3	1	2	3	1	2	3
Meltdowns	1	2	3	1	2	3	1	2	3
Sleepiness	1	2	3	1	2	3	1	2	3

16. Do you have any additional comments about changes in a child's **behaviour** following intervention in the Snoezelen® room?

SCHOLASTIC PERFORMANCE

17. Please indicate on the scale to which degree you find occupational therapy in the Snoezelen® room effective in improving a child's **scholastic performance**:

Not at all effective	Very little effect	Somewhat effective	Very effective
1	2	3	4

18. Please use the rating scales to describe your observations on changes in a child's **scholastic performance** that you observe following their OT intervention in the Snoezelen® room.

	IN WHAT WAY DOES A CHILD'S SCHOLASTIC PERFORMANCE CHANGE FOLLOWING OT IN THE SNOEZELEN ROOM?			HOW OFTEN IS THIS CHANGE NOTED FOLLOWING OT IN THE SNOEZELEN ROOM?			FOR HOW LONG ARE THESE CHANGES NOTED FOR FOLLOWING OT IN THE SNOEZELEN ROOM?		
	Becomes worse	Stays the same	Improves	Never	Some-times	Always	Minutes	Hours	Days
Handwriting	1	2	3	1	2	3	1	2	3
Reading	1	2	3	1	2	3	1	2	3
Mathematics	1	2	3	1	2	3	1	2	3
Planning of work	1	2	3	1	2	3	1	2	3
Organisation of work	1	2	3	1	2	3	1	2	3
Memory	1	2	3	1	2	3	1	2	3
Following instructions	1	2	3	1	2	3	1	2	3
Working independently	1	2	3	1	2	3	1	2	3
Initiation of tasks	1	2	3	1	2	3	1	2	3
Completion of tasks	1	2	3	1	2	3	1	2	3
Pace of work	1	2	3	1	2	3	1	2	3
Problem solving	1	2	3	1	2	3	1	2	3
Test scores	1	2	3	1	2	3	1	2	3

19. Do you have any additional comments about changes in a child's **scholastic performance** following intervention in the Snoezelen® room?

_____

20. Do you think it is beneficial for schools to have a Snoezelen® room on their campus?

YES ☐ NO ☐

Appendix B: Information Sheet

Good day,

I am Occupational Therapist, Mika Solomon, completing a master's degree in Occupational Therapy at the University of the Witwatersrand. The title of my study is as follows: Teachers' and Therapist's knowledge and perception of the effects of Snoezelen® in occupational therapy treatment.

The aim is to investigate teachers' and therapist's perceptions of the effects of the Snoezelen® room on children's behaviour and changes on performance, as an occupational therapy modality in a specialised school environment. I would be most grateful if you and your staff members would consider participating in this work.

Much research has been done surrounding the positive effects on children's behaviour and performance within the multi-sensory environment (MSE), however there has been little research done on the transfer of these changes of behaviour and changes in performance into other environments, such as the school or classroom environment. It is important that the transfer of knowledge, skills and behaviour from the MSE into the classroom environment be explored to validate the benefit of having a MSE within school environments. This will be done by reviewing teachers' and therapist's perceptions of the use of the MSE by having them identify changes in behaviour and performance that they have noted within the classroom, therapy sessions or school environment, following occupational therapy intervention within the Snoezelen® room.

What do we expect from the participants in the study? You will be asked to complete an online survey that will require about 20 to 30 minutes of your time.

May I withdraw from the study? Certainly, you may do this at any time without having to give a reason. Remember that the study is completely voluntary and not taking part in it, or withdrawing from it, carries no penalty of any sort.

What about confidentiality? Confidentiality will be maintained by the use of a code instead of names on all results. Names will not be asked in order to maintain anonymity.

If you have any queries or concerns or would like further clarity, more information may be obtained from Mika Solomon at email address, mikaashleysolomon@gmail.com.

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research. If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za.

Thank you,
Mika Solomon
BSc (OT)

Appendix C: Informed Consent

INFORMED CONSENT TO PARTAKE IN THE FOLLOWING STUDY:

TEACHERS' AND THERAPIST'S KNOWLEDGE AND PERCEPTION OF THE EFFECTS OF SNOEZELEN® IN OCCUPATIONAL THERAPY TREATMENT.

I confirm that I have been informed by Mika Solomon about the nature of the study. I have also read and understood the information sheet. I have also been given the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

I understand that my personal information will be kept confidential.

I understand that I can obtain information in relation to the project at any time by contacting the researcher.

Data will be kept for two years if published or six years if not published, after this period the data will be destroyed.

I agree to take part in the abovementioned study.

Name and Surname of Participant	Signature	Date

Person Explaining Informed Consent (Designation): _____

Printed name	Signature	Date

Appendix J: Turnitin Report



M Solomon Turnitin

ORIGINALITY REPORT

9%	7%	4%	2%
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Appendix K: Plagiarism Declaration

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I MIKA SOLOMON (Student number: 1030819) am a student registered for the degree of MSc (OT) in the academic year 2024.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature:  Date: 24/03/2024