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AN OVERVIEW OF APPLIED BEHAVIOURAL ANALYSIS AND ITS POTENTIAL USE FOR TREATING CHILDREN WITH AUTISM IN SOUTH AFRICA

Presented to School of Education at the University of the Witwatersrand

In partial fulfilment of the requirements for the degree

Master of Education (INCLUSIVE EDUCATION)

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17 MARCH 2025

UNIVERSITY OF THE WITWATERSRAND

SCHOOL OF EDUCATION

Declaration

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Dedication

As I dedicate this conceptual study, I am reminded of my profound commitment to improving the lives of children and families living with Autism in South Africa. By acknowledging the remarkable bravery and resilience of these individuals, I demonstrate my deep understanding of the challenges they face and my passion for creating positive change.

My dedication also underlines my study's focus on promoting inclusive and equitable education for all, recognizing the transformative power of quality education in empowering individuals with Autism. Furthermore, I acknowledge the often-overlooked population of undiagnosed, underdiagnosed, and under-resourced autistic children, and I want them to know that they are not forgotten. By explicitly stating this, I reaffirm my dedication to advocating for the most vulnerable members of the Autism community.

"Autism is not something a person 'has,' it is something a person 'is.' It is a part of who they are, and it shapes their experiences and perceptions of the world." - Donna Williams

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I would like to express my deepest gratitude to God Almighty, the Supreme Provider, whose boundless grace and mercy have guided me throughout my educational journey.

I am also profoundly grateful to my father -Prophet Philip Banda, whose unwavering support, guidance, and encouragement have been the driving force behind my academic pursuits. This achievement would not have been possible without his selfless devotion.

Furthermore, I would like to express my heartfelt gratitude to my beloved family, colleagues, and friends who generously contributed their time, expertise, and support to this research project. Despite the numerous challenges faced, their willingness to participate and share their insights has been invaluable in shaping this research.

Abbreviation list:

ABA: Applied Behaviour Analysis

ASD: Autism Spectrum Disorder

DTT: Discrimination Trial Training

FCT: Functional Communication Training

NET: Natural Environmental Training

PECS: Picture Exchange Communication System

SD: Stimulus Descriptor

WHO: World Health Organization

ZPD*:* Zone of Proximal Development

VB-MAPP: The Verbal Behaviour Milestones Assessment and Placement Program

ABLLS®-R: the Assessment of Basic Language and Learning Skills®-Revised

(FBA): A Functional Behaviour Assessment

Abstract

Applied Behaviour Analysis (ABA) is a widely recognized intervention for treating Autism Spectrum Disorders (ASD), rooted in the understanding that behaviour is shaped by external stimuli. It involves using reinforcement and punishment to either encourage or discourage specific behaviours. ABA has shown promise in various global contexts, but its application in South Africa remains underexplored.

This study seeks to evaluate the effectiveness of ABA as a therapeutic approach for students diagnosed with ASD in South Africa. The goal is to assess whether ABA can be adapted to better fit the unique needs of South African learners with ASD.

This conceptual study employed a scoping review approach, analysing secondary data.

The findings of the study suggest that ABA is a highly effective intervention, capable of targeting a wide range of developmental domains. The results highlight the flexibility of ABA in promoting skill acquisition in a manner that aligns with natural learning processes. However, it also emphasizes the need for ABA to be contextualized to address the specific cultural, educational, and social dynamics in South Africa.

The research concludes that while ABA is an effective intervention for students with ASD in South Africa, there is a need for further adaptation and local customization to fully address the unique challenges and opportunities in the South African educational background.

Keywords: Applied Behaviour Analysis, Autism Spectrum Disorder, Behavioural Intervention, South Africa, Early Childhood Education, Autism Treatment

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CHAPTER ONE: INTRODUCTION

1.1 Background of The Study

Autism can be defined as neurodevelopmental disorders which are evident in the initial phases of development, are categorised by developmental incongruities that impair individual, societal, academic, or occupational functioning (American Psychiatric Association, 2013). Autism, primarily categorised as a type of schizophrenia, was reclassified in 1980 as Infantile Autism in the 'Diagnostic and Statistical Manual of Mental Disorders' (DSM-3) and later merged into the broad classification of autism spectrum disorder (ASD) in the DSM-5 (Cook & Willmerdinger, 2015).

Autism spectrum disorder (ASD) is a neurological developmental disorder which significantly impacts social communication and conduct. Elsabbagh et al., (2012) states that it is approximated that 1 in 59 children in South Africa are detected with ASD every year. It is a 'developmental disorder' that was first categorised by Leo Kanner in 1943 in a case study of 11 children, since then the diagnostic criteria has progressed (Corsello, 2005). According to the Star Academy (2022), "Autism, or autism spectrum disorder, refers to a range of conditions characterised by challenges with social skills, repetitive behaviours, speech, and nonverbal communication, as well as by unique strengths and differences. We now know that there is not one autism but many types, caused by different combinations of genetic and environmental influences".

The term "autism" is derivative from the Greek word "autos", meaning self. Although often associated with Leo Kanner, it was initially introduced by Swiss Psychiatrist Eugene Bleuler in 1911 to describe individuals who displayed social withdrawal and isolation (The Star Academy, 2022). Progressively, the classification and investigative standards for autism have undergone substantial modifications. Kanner, in the 1940s, characterized autism as a marked inability to engage in typical social interactions from early childhood, establishing it as a distinct condition separate from schizophrenia (The Star Academy, 2022).

In 1943, the term "Early Infant Autism" was coined to elucidate a group of children exhibiting affective contact disturbances and language development delays (Guler, Vries, Series, Shabalala, Franz, 2017). By 1981, autistic behaviours were categorized into three classifications: 'deficiency of social interaction', 'lack of appropriate language skills', and

‘restricted interests or behaviours’. These categories laid the foundation for the concept of the autism spectrum, which was formally recognized in 1988.While there has been a global upsurge in ASD research recently, it is significant to remember that high-income nations like the United States provide most of the research on ASD (Guler, Vries, Series, Shabalala, Franz, 2017). In the last decade, global autism awareness and research have increased significantly (Daniels et al., 2017). Epidemiological studies have consistently shown that autism is more likely to be diagnosed in males than females, with a male-to-female ratio of approximately 4:1 (Taylor, 2006).

Historically, autism was approximated to be prevailing in 2 in every 10,000 children in the 1970s (Sun & Allison, 2010). More recent studies have reported a higher prevalence, with estimates ranging from 4-10 cases per 10,000 children (Taylor, 2006). Finbonne (as cited in Taylor, 2006) suggests an even higher prevalence 40-60 cases per 10,000 individuals. The increasing trend in reported cases suggests that autism is becoming more recognized and diagnosed.

Certainly, no two students with autism have precisely the same ability deficiencies. Consequently, to address each child's unique skill deficiencies, it is critical to create an individualized plan (The Star Academy, 2022). To assess a student with autism- these eight domains are necessary in assessment: “Cognition, Language, Executive, Functioning, Motor skills, play, adaptive, social, academic” (Autism in South Africa - the Star Academy, 2022). These domains are interconnected, meaning that a child's deficiencies in one domain will lead to deficiencies in other domains. To create a program to help the student with autism catch up, it is crucial that we thoroughly evaluate and identify the skills that the child is missing. Behaviour modification is a component of ABA ASD (Guler, Vries, Series, Shabalala, Franz, 2017). The only approach to lessen the maladaptive behaviours that many students with autism s exhibit is to concentrate on them developing new skills. Additionally, a behaviour intervention plan should be given to each child, targeting the skills inadequacies of that particular autistic child.

There is no known medical treatment for this neurodevelopmental disease, which is lifelong (Baer, 2015). According to Francis (2005) as citied in Baer, (2015), the term "treatment" refers to interventions and therapies intended to support people with ASD in making a more successful adjustment to their surroundings. Numerous therapies for children with ASD have been created over time and have grown from various philosophies. According to Corsello

(2005), these tactics could involve behavioural, developmental, and cognitive treatments. Although every strategy employs distinct intervention techniques, many of the interventions' constituent parts share a great deal of commonality. When thinking through each method, it's critical to remember that different children with ASD may have different success rates, therefore each strategy should be customized to meet the unique indigence of each student (Baer, 2015).

Recent years have seen a sharp surge in intensity in the occurrence ASD, particularly in North America where 1 in every 165 children is diagnosed with the condition. This increase in diagnoses has been attributed in part to advancements in technology and changes in how children with ASD are classified. Research implies that hereditary and prenatal influences play a substantial role in the development of ASD, with genetics being identified as a primary contributing factor. However, much of the research on ASD is based on Western perspectives, and there is a lack of information on the frequency of ASD in African countries and other developing regions. The existing level of knowledge on autism in Africa emphasizes the critical essential for additional study, resources, and policy changes to meet the unique issues that people with autism and their families confront in this context (Aderinto, Olatunji, & Idowu, 2023). According to Abubakar et al. (2016), autism affects 11.5% of children in North Africa, with over 50% of cases being nonverbal. Guler et al. (2017) discovered in South Africa, that children of colour were diagnosed at a considerably greater rate than other race groups, correspondingly, it is estimated that 1 in 59 children in South Africa are diagnosed with ASD (Elsabbagh et al., 2012).

'The Millennium Development Goals' as set out by the United Nations (United Nations, 2015) and 'The Sustainable Development Goals' (United Nations, 2017) marked a transition in concentration from subsistence to determination to strive, directing to make progress on the morbidity accompanying with developmental impairments in students, including those with ASD. The global pervasiveness in 2018 of ASD was approximated at 1-2%, with limited knowledge of prevalence in Africa, especially in South Africa (Bakare et al, 2016). However, Bakare et al. (2016) conducted a systematic review that found that the estimated occurrence of autism spectrum disorder in Africa ranged from 1 in 100 to 1 in 2,000 children. Franz et al. (2018) suggested that prevalence rates in Africa are likely not significantly lower. Additionally, mental health policy in a country is indispensable to reflecting the authority's dedication to facilitating mental well-being facilities (Franz et al., 2018).

Aderinto, Olatunji, & Idowu, (2023) and Bakare, Munir, & Bello-Mojeed, (2016) have shown that the predominantly existing landscape of literature on ASD originates from Europe and North America, with a significant gap in research coming from African countries. This lack of local knowledge of ASD is particularly evident in South Africa for the reason that there is scarcity of identification and support for students with ASD. This underscores the importance of conducting studies that focus on ASD within local contexts to tackle challenges bearing in mind the specific needs and contests faced by individuals with ASD in different regions.

Furthermore, In South Africa education was strictly segregated during the apartheid era (1948–1994). Because of the Bantu Education Act of 1953, which consolidated state control over Black education, it was severely underfunded, frequently receiving only a tenth of the funds given to white schools (Mahlaule, McCrindle, & Napoles, 2024). As a result, there were inadequate facilities, overcrowded classrooms, and underqualified teachers. Both racial and disability-type segregation were in place for children with disabilities, including developmental disorders (Mahlaule et al., 2024). While Black, Indian, and coloured children had fewer options and subpar services, white students with disabilities had access to better-resourced special schools, trained staff, and support (Mahlaule et al., 2024). During apartheid, early pioneers like Sonia Machanick established multiracial special schools (like the Japari School) that provided phonics-based educational interventions for particular learning disabilities, but these were still uncommon exceptions (Mahlaule et al., 2024).

The 1996 Democratic Constitution and the Schools Act of the same year established the principles of inclusive education and banned discrimination based on disability and race (Department of Basic Education, 2001). The White Paper on Inclusive Education (2001) committed to integrating learners with special needs into mainstream public schools by 2021. Nonetheless, the rollout of these initiatives was insufficient (Naicker, 2018). Human Rights Watch (2015) reported widespread systemic issues: children with disabilities continued to face exclusion, were often redirected to specialized schools unnecessarily, and many remained on waiting lists without receiving government funding or support(Naicker, 2018). By the mid-2010s, hundreds of thousands of children with disabilities were either not attending school or were waiting for placement—approximately 5,552 children were on waiting lists in 2015, and in 2016, it was estimated that nearly 600,000 children with disabilities were out of school altogether (Mahlaule et al., 2024).

The recent issues of autistic children in South Africa have been emerging into the limelight over the last ten years. In 2022 Pillay, Duncan, and de Vries (2022), conducted a study in the Western Cape one of the better resourced provinces in South Africa that revealed that only 940 children with ASD were found among 1.15 million, representing under-identification at around 0.08% compared to an estimated global rate of 1% prevalence. Diagnosis pathways are disordered and long, usually involving primary care referral to specialist clinics with up to 18 MONTHS' wait (Pillay et al., 2022). Median waiting time for diagnosis is approximately 42 months, usually much later and language delay is more severe in Black children (94% non-verbal at diagnosis, compared to 42% of White children), showing racial-socioeconomic inequalities (Pillay et al., 2022). After diagnosis, Autism-specific school placement involves another lengthy waiting list; over 50% wait over a year, many waiting over three years. In 2016, there were 266 legally school-aged children not in any education; only 36% of waiting children were of school age (Pillay et al., 2022).

In addition, public special schools in South Africa are critically short of therapists and support personnel (Mahlaule et al., 2024). Occupational therapists (OTs) work with 300 or more learners and take ridiculously inordinate amounts of time away from intervention doing administrative work, for example, SASSA grant applications (Pillay et al., 2022). Professional deployment is grossly unequal: private sector and better-provided provinces have therapists; poorer-resourced or rural communities have zero services. Classroom aids and assistive technology are scarce. Autism is poorly understood in most communities throughout South Africa—and across sub-Saharan Africa as a whole. It is often stigmatized, and sometimes caused by supernatural forces or shame, and so families will avoid or delay seeking assistance. Parent-network and advocacy activity are increasing, particularly in urban centres such as Johannesburg and Pretoria (e.g. Tamarisk School), but are still short of needed demand (Mahlaule et al., 2024).

Moreover, disparities in wealth and resources (human and physical) complicate diagnosis and treatment in developing countries like South Africa. Take for instance, South Africa's socio-economic disparity is designed in a way such that private services such as diagnosis, early intervention, and autism-specific schooling are accessible mainly only to more affluent families, disproportionately White, Indian, or Asian families, while Black families are underrepresented in private programs because of expense. Private healthcare and education facilities, which are better funded in general, are largely frequented by high-income families.

This segment is likely to comprise White, Indian, or Coloured families, who hold urban positions and enjoy greater access to information and monetary means (Cooper, 2016). Conversely, most Black South African families, particularly those residing in rural and peri-urban settings, are plagued by severe economic deprivation that restricts their use of private diagnostic and treatment methods for autism. Public health services and education, which cater to the majority of the population, are overburdened and under-financed with an over-disproportionate number of specialists—such as psychologists, occupational therapists, and speech-language therapists—working in the private sector (Lund, 2020). This leaves the students with extended waiting times to be diagnosed and treated in public hospitals, usually postponing much-required developmental services during the critical early childhood years.

Another challenge lies in the use of diagnostic tools for ASD. Most standard diagnostic instruments were developed in high-income, predominantly Western contexts. These tools often lack cultural and linguistic adaptations for South Africa's diverse population, leading to misdiagnosis, underdiagnosis, or delayed diagnosis (Van Biljon et al., 2015). South Africa's multilingual society adds further complexity, as children are often assessed in a second or third language, reducing the accuracy of language-based assessments. Moreover, clinician bias and diagnostic overshadowing, where symptoms of autism are misattributed to other developmental or behavioural conditions, are more likely to affect children from marginalized backgrounds (Dawson-Squibb, McKenzie, & Chersich, 2021). These systemic issues reflect broader patterns of structural exclusion that hinder equitable access to healthcare for neurodevelopmental disorders.

1.2 Rationale

The researcher chose to look at this topic because it is essential to recognize that every child with autism is unique and may respond differently to intervention strategies. By customizing ABA interventions to suit the distinct needs and partialities of students with autism in South Africa, we can improve the effectiveness of the interventions and in due course enhance the outcomes for these students.

Take for instance, "Individualized Treatment for Young Children with Autism in a Community Program" by Granpeesheh et al. (2009): takes place in a community program setting, indicating that the findings are applicable to real-world scenarios where children with autism receive treatment and support in their everyday environments. This context highlights the practical implications of individualized treatment plans in ABA interventions and underscores the

significance of considering the specialised needs and preferences of each child with autism in community-based settings. The results showed that individualizing treatment based on each students unique needs and preferences led to better conclusions in terms of behaviour improvement and skill acquisition. Furthermore, Divan et al. (2019) focused on the systematic review of ABA interventions for children with Autism in low and middle-income countries. The findings of this inquiry highlighted the setbacks and possibilities associated with implementing ABA interventions in these regions, including South Africa. This research emphasized the significance of adapting interventions to align with the local context and cultural norms to enhance the efficacy of the treatment.

The goal of South Africa's inclusive education framework, as outlined in White Paper 6 (Department of Education, 2001), is to integrate special needs students into regular public schools. Effective inclusion is hampered by systemic issues like packed classrooms, a lack of individualized support, and general educators' scant knowledge of autism spectrum disorder (ASD). In South Africa, public education discourse and practice still mostly ignore ABA, a data-driven and evidence-based intervention that is frequently used in high-income countries to support children with autism (Pillay & Girdler, 2020). This disparity is made worse by the scarcity of qualified behaviour analysts, especially in rural and low-income areas.

Moreover, specialist training for teachers and school-based support teams is not routinely integrated into pre-service or in-service professional development. Teachers frequently report a lack of confidence in supporting learners with autism, let alone applying specific behavioural interventions like ABA. In this context, implementing ABA is not just a technical endeavour, it requires capacity-building within schools and ongoing training for educators, aligned with inclusive education goals (Dawson-Squibb et al., 2020).

Ramseur, De Vries, Guler, Shabalala, Seris, & Franz, (2019) contend that equally important is the role of parents and caregivers. Given South Africa’s limited availability of specialist services, parents often become secondary therapists. Thus, any ABA-based model must incorporate parent training and support as a core component (Ramseur et al., 2019). Lifelong learning for caregivers, especially in the form of caregiver-mediated interventions and task-sharing models, can help bridge service gaps, but these programs need further development and policy support to be scaled nationally (Ramseur et al., 2019).

Replicating these studies in the South African context could provide beneficial comprehensions into the feasibility and efficacy of ABA intermediations for students with Autism in the region.

By understanding the unique challenges and opportunities that South Africa presents, researchers and practitioners can tailor interventions to bridge the gap for the needs of the local population. This approach could lead to improved outcomes for students with autism in South Africa and contribute to the broader understanding of implementing ABA interventions in low and middle-income countries.

1.3 Problem Statement

The problem that this research would address is the lack of adapted and culturally sensitive ABA interventions for children with autism in South Africa. By not considering the unique needs and preferences of each child, the effectiveness of ABA interventions may be limited, leading to suboptimal outcomes for these children.

With a diverse population, South Africa consists of various cultural and linguistic groups. This diversity poses a challenge when it comes to providing outcome-based strategies for students with autism, as cultural beliefs and practices; for example, in some communities, there may be beliefs in traditional or alternative treatments for Autism, such as herbal remedies or spiritual healing and there may be stigma and negative attitudes towards mental health conditions, including Autism. This may influence the acceptance and effectiveness of ABA interventions. It is imperative to ponder these cultural components to provide interventions that are not only effective but also culturally sensitive.

Furthermore, the lack of resources and trained professionals in the field of ABA in South Africa adds to the challenge of providing personalized interventions for students with autism. By conducting research that explores approaches for adapting ABA interventions to meet the individual needs of these children, we can help bridge the gap in the availability of culturally sensitive and effective interventions in the country.

1.4 Aim

The aim of this research is to undertake a conceptual study and delve into the strategies for ABA interventions to meet the distinct requirements and preferences of students with ASD in South Africa, with the goal of refining the outcomes and standard of living- general well-being for these children. Additionally, the research is to explore the effectiveness of generally using ABA strategies.

1.5. Research Question/s –

- What is the theoretical framework of Applied Behaviour Analysis (ABA), and how does it inform treatment approaches for children with Autism in South Africa?
- How does the Applied behaviour Analysis model specifically address each functioning domain for learners with Autism in the South African context?
- What are the key factors that contribute to the effective application of the ABA model for learners with autism in South African schools?

1.6 Definition of Terms

Autism: A neurological disorder categorised by obstacles in societal interaction, vocal and nonvocal communication, and recurring behaviours.

Applied Behaviour Analysis: "direct application of behaviourism to the improvement of human behaviour encourage the advancement of human behaviour whereby all behaviours consist of antecedents and consequences" (Axelrod et al., 2012, p.3).

The 3-term Contingency -Antecedent, Behaviour and Consequence

Antecedent -An event or stimulus that occurs immediately prior to the behaviour (For example- Annalisa has no sweets)

Behaviour -Anything the child says or does after the antecedent (For example: she cries)

Consequence -Any event or stimulus that occurs immediately after the behaviour (Annalisa gets sweets)

Behavioural Intervention Plan: "Behaviour intervention plans outline strategies and tactics for dealing with the problem behaviour along with the role that educators must play in improving student learning and behaviour" (Killu, 2008, p.140).

Discrete trial training: involves isolating a task, breaking it down into smaller components and teaching it to a person over the course of several trials (repetition teaching). The learner is given a specific opportunity to answer, and they are expected to act in response in a precise way (Eikeseth et al., 2014).

Individual Education Plans (IEPs): "A personalized legal educational assistance written plan with specific goals in which special resources are delivered to a child to help them succeed" (*The Star Academy*, 2022).

Progress reports: is a document aims to detail and review a student's progress toward the goals and objectives set in their IEP. (*The Star Academy*, 2022).

Treatment: A planned and intentional process aimed at reducing symptoms, improving functioning, and enhancing the overall well-being of students with autism.

Family Support: The provision of emotional, informational, and practical assistance to families of autistic children to facilitate their coping, adaptation, and empowerment.

South African Context: Refers to the cultural, social, economic, and healthcare environment specific to South Africa, which shapes the experiences, challenges, and opportunities faced by students with ASD and their families.

Stimulus: Actions/ events in the natural environment that modify the conduct of an individual.

Functional Communication Training: The process of educating autistic children how to verbally communicate as opposed to problematic behaviours when they are in need(Tiger et al., 2008).

Generalisation: refers to the capacity to acquire a skill in a single context and then apply it to other contexts that are comparable but distinct (Caha, 2017).

Natural Environment Training: Learning that occurs in a playful or unintended environment (Hall, 1982).

Non-Compliance: An instance or circumstance where a student does not follow guidance, prompts (Rortvedt & Miltenberger, 1994).

Picture Exchange Communication System (PECS): In order to develop expressive communication skills, a method is put in place to assist students in developing the skills. (Sulzer-Azaroff et al., 2009).

Random Rotation: Integrating distinction and assimilation of formerly acquired skills (Turnbull & Knapp, 2014).

SD Modification: In an attempt to slowly reduce problematic behaviours until they are non-existent, there is a need to continuously transform presenting the stimulus to alienate problematic behaviours. (Koegel et al., 1977).

Neurodiversity: The distinctions in cognitive, emotional, and behavioural functioning in particular the diversity of human brains and minds.

Evidence-Based Practice (EBP): An approach to healthcare and education that incorporates the best available research evidence with clinical expertise and client values.

Positive Behavioural Supports (PBS): An approach to supporting autistic students and other impairments that focuses on creating supportive environments, teaching alternative behaviours.

Universal Design for Learning (UDL): This model strives to foster all n inclusive learning environment, ensuring all students have equitable access to educational resources and experience.

Overview of the chapter

There has been a significant range of research exploring ABA's applications in treating/ educating children with autism, however, much of the research has been done and applicable to the Northern Hemisphere. Springer, van Toorn, Laughton, & Kidd, (2013) state that "The prevalence of the pervasive developmental disorders (PDDs) or autism spectrum disorder (ASD) in South Africa is unknown." There has not been much research done on the effectiveness and applicability of the model applied in a diverse cultural country like South Africa. The purpose of this study was to assess how well the ABA model works as an intervention for autism spectrum disorders. This study has made an effort to comprehend the pertinent literature about autism and the treatment approach of Applied Behaviour Analysis.

CHAPTER 2: METHODOLOGY

2.1 Introduction

"Though there are several sources of knowledge, social science researchers are dependent on organized procedures to ascertain social facts, and these organized structures are known as research methods" (Blackstone, 2018, p.10). A research methodology serves as a structured guide that researchers follow when carrying out a research. Twining, Heller, Nussbaum, and Tsai (2017) explain that it outlines the rationale behind the choice of approaches and procedures

used in a particular study. This chapter involves an overview of the methodology applied in this scoping study to assess the current knowledge surrounding the use of Applied Behaviour Analysis (ABA) in treating autistic students in South Africa. It additionally describes the approach I followed in collecting data, including designing the study's objectives, and detailing the data collection and analysis methods used in the study. Finally, this section discusses potential limitations and ethical factors encountered in the study.

2.2 Research Design

A research design serves as a comprehensive proposal outlining the techniques for study selection, data collection, and data analysis, while also addressing potential ethical concerns (Welman et al., 2005; Twining et al., 2017). When developing a research design, it is crucial to specify the research methodology, article characteristics, selection strategy, information collection procedures, data analysis techniques, and ethical considerations (Welman et al., 2005; Twining et al., 2017). This study's research design is a scoping review methodology to investigate the range of current literature and pinpoint knowledge gaps about ABA and autism therapy in South Africa.

The research involves reviewing and synthesizing the literature, once applicable sources have been identified, the next step is to review and synthesize the literature. This involves summarizing key findings from each source and identifying common themes or trends in the research. Analysing the data, after reviewing and synthesizing the literature, the next step is to analyse the data to draw conclusions and identify any gaps in the research. This may involve comparing and contrasting different studies and critically evaluating the strengths and limitations of the existing research.

Arksey, O'Malley, (2005, pg. 22) state that the scoping study methodology "is guided by a requirement to identify all relevant literature regardless of study design". The guiding stages adopted are: Identifying the research question; The first step in conducting a scoping study is to clearly define the research question or objective (Levac, Colquhoun, O'Brien, 2010). In this case, the research question could be: "What is the current state of knowledge on the use of ABA for treating children with autism in South Africa?". The second step: Search strategy; The next step is to develop a search strategy to identify relevant literature on the topic. This involves searching academic databases, websites such as PubMed, PsycINFO, and Google Scholar and other sources for studies, reports, and other documents related to ABA and autism treatment in South Africa

Furthermore, it is the selection criteria; Once the relevant literature has been identified, the next step is to establish selection criteria for determining which studies to include in the scoping study (Arksey, O'Malley, 2005). Then, Data extraction; the data extraction process involves extracting relevant information from the selected studies, such as key findings, methodologies used, and conclusions (Arksey, O'Malley, 2005). This information will be used to map out the key concepts and themes in the literature. Lastly, "collating, summarizing and reporting the results" (Arksey, O'Malley, 2005, pg.27)

Moreover, Arksey, O'Malley, (2005, pg. 22) stipulate that "the process is not linear but iterative, requiring researchers to engage with each stage in a reflexive way and, where necessary, repeat steps to ensure that the literature is covered in a comprehensive way".

2.3. Type of Research

"An integrative review is a specific review method that summarizes past empirical or theoretical literature to provide a more comprehensive understanding of a particular phenomenon or healthcare problem" (Whittemore and knafl, pg.1, 2005). This study adopts a conceptual research methodology-Scoping and Integrative, focusing on synthesizing and mapping the existing literature on ABA and autism treatment. Rather than conducting novel experiments or collecting empirical data, this scoping study aims to provide a comprehensive summary of the current knowledge base, highlighting key themes, research gaps, and areas for future investigation.

This scoping review objectives are to afford a comprehensive summary of the existing literature on the utilization of ABA in treating students with ASD in South Africa (Arksey, O'Malley, 2005). The primary objectives of this review are to identify and categorize the available evidence, clarify key concepts and definitions, and examine the methodological approaches employed in previous research (Arksey, O'Malley, 2005). Furthermore, this review seeks to identify key characteristics and factors related to ABA, as well as gaps in the current knowledge base, with the ultimate goal of informing future research and practice in this area.

The initial objective of this study is to delineate the scope, extent, and nature of research on ABA and autism treatment, with a specific emphasis on global studies and those conducted in South Africa. By doing so, this research seeks to inform the optimal application of ABA in the South African context, ultimately contributing to improved treatment outcomes for individuals with autism.

2.4 Location of the Study

This conceptual scoping review explores the existing literature on Applied Behaviour Analysis (ABA) in autism treatment, with a focus on studies conducted in South Africa and other countries (in the last two decades) between 2001 and 2024. By focusing on South Africa, I am acknowledging the country's unique blend of cultures, healthcare systems, and educational frameworks, which all play a crucial role in shaping the lives of children with autism. The goal is to uncover the specific challenges, opportunities, and cultural nuances that impact the effectiveness of ABA therapy in this context, ultimately informing more tailored and compassionate support for families and children affected by autism.

2.5. Inclusion and Exclusion Criteria

To ensure that the review is focused and relevant, the study will apply specific inclusion and exclusion criteria to the selected literature. The inclusion criteria for this study include:

The keywords used to obtaining the relevant literature included, “autism”, “applied behavioural analysis global and locally”, “techniques that are used in ABA”, “Children with autism” “Intervention strategies”, “South African education structure and policy”, inclusive practices in South Africa”, “Evidence-based practice”, “Autism treatment” and “Behavioural interventions”. The search engines used included much of the Wits library which incorporated a considerable amount of imperative knowledge or research on autism, about 10 articles were used on AUTISM but lacked any on ABA.

However, search engines such as google scholar, PubMed, PsycINFO, ERIC were utilized in order to obtain and search on applied behavioural analysis and how it can be used as an intervention/ treatment for autistic children. The study’s focus necessitated the date delineation of the period from the last quarter century (2001-2010 ‘first decade’, 2011-2020 ‘second decade’, 2021-2025 ‘part of the 3rd decade). Initially, 25 articles were identified, but a more focused selection of 10-15 articles from Google Scholar and other academic databases was utilized. The 25 articles were pivotal in edifying the understanding of Applied Behaviour Analysis (ABA) implementation globally, locally, and in multi-contexts, particularly in sub-Saharan countries, including South Africa.*

Inclusion and Exclusion Criteria:

Inclusion Criteria:

- . Studies focusing specifically on the application of Applied Behaviour Analysis (ABA) in the treatment of autism in children.
- Research published within the last two decades, ensuring the review reflects the most current developments in ABA treatment for autism in children.
- Peer-reviewed journal articles as well as grey literature from reputable organizations, ensuring credibility and reliability of sources.
- Studies conducted within the South African context or those directly relevant to the South African healthcare system, or those offering comparative analysis.

Exclusion Criteria:

- Studies that do not focus on ABA or autism treatment, such as those that examine other therapeutic interventions.
- Publications not in English, unless reliable translations are available.

This conceptual research into ABA and the treatment of autism in South Africa may be afflicted by limiting factors that might affect the scope and depth of such available studies. First would be a concern that ABA as a topic of concern is rather limited within the country. While internationally, ABA is recognized as one of the effective interventions for Autism Spectrum Disorder, this has not been the case in South African research. This results in a general lack of good quality, localized studies that meet the inclusion criteria for a comprehensive review of ABA's impact within the South African context. A further complication lies in the dearth of recent studies. As ABA only recently came into greater focus in South Africa, there could be fewer recent studies on ABA for the treatment of autism, particularly those conducted within the last twenty years. Less recent studies or few studies conducted make the assessment of trends, methodologies, and outcomes pertaining to the present time even more difficult.

Language barriers also pose significant challenges. Research in South Africa is often conducted in multiple languages, and if studies are not translated into English, valuable insights may be lost (Mancini-Cross, Backman, & Baldwin, 2009). This could limit access to important local research, as many South African authors or institutions publish in languages other than English. Furthermore, conducting comparative analyses with international studies introduces complexity due to the distinct healthcare system and socio-economic context in South Africa (Mancini-Cross, Backman, & Baldwin, 2009). The generalizability of findings from other

countries may be limited, particularly when considering local resources, access to services, and cultural differences that affect the implementation of ABA interventions.

While grey literature might hold potential in filling gaps in evidence, there are also some specific challenges in using such literature. By their very informal nature and the absence of strict peer review, one can call into question the reliability and credibility of the data presented (Adams, Smart, & Huff, 2017). Grey literature that is relevant to ABA and the treatment of autism within a South African context might be challenging to locate because of the specificity of the research (Adams, Smart, & Huff, 2017). Ethical and cultural considerations also go hand in hand with carrying out research within a diverse society like that of South Africa. Various studies might miss the need to culturally adapt ABA interventions to ensure that these interventions align well with local values and customs. Research that overly narrows down to ABA without taking into consideration these adaptations may not find applicability in the South African context.

2.6 Research Instrument

The primary instrument for this study will be a rigorous literature review process. Key to this process is the systematic search, selection, and data extraction from relevant sources, which will provide a broad understanding of the current state of ABA and autism treatment in South Africa.

2.7 Data Analysis

In order to analyse the data derived from published sources, the investigator employed a method known as thematic analysis. This technique encompassed several essential components, such as coding and categorizing the data, interpreting its meaning, and identifying and labelling the emergent themes. A scoping study of data analysis involves the systematic review and synthesis of literature (Hamel, Michaud, Thuku, Skidmore, Stevens, & Turcotte, 2021). Data analysis for recurring themes, trends, and gaps will be done after identification and extraction of relevant literature. The focus of the analysis shall be on how effective and adapted ABA-based interventions have been in South Africa, and the challenges faced by practitioners and families in implementing such therapies (Hamel, Michaud, Thuku, Skidmore, Stevens, & Turcotte, 2021). The approach for literature analysis shall thus be thematic in nature, providing scope to catalogue the literature to review the comprehensiveness of knowledge on topics of interest and their depth (Hamel, Michaud, Thuku, Skidmore, Stevens, & Turcotte, 2021). This

study also contrasts and compares the findings of various studies regarding where evidence exists and is not very strong.

2.8 Ethical Considerations

As this research is a literature-based scoping review, the study does not involve direct interaction with human subjects. However, ethical considerations still play an important role in ensuring the integrity of the research process. The study will adhere to ethical guidelines regarding proper citation of sources, avoiding plagiarism, and ensuring the transparency and rigor of the literature selection and synthesis process. Additionally, care will be taken to respect the intellectual property rights of the authors of the studies included in the review.

2.9 Summary

This chapter highlighted the methodology of conducting a scoping review of the use of ABA to treat children with autism in South Africa. This study design, based on Arksey and O'Malley's 2005 framework for scoping studies, guides the process of identifying, selecting, and analysing literature. Ethical considerations and a strict process for data collection and analyses were also put forward. By synthesizing the current state of knowledge, this review intends to establish the lacunars of research, further explorations that might be needed, and their implications for practice in South Africa.

CHAPTER 3:LITERATURE REVIEW

What is the theoretical framework of Applied Behaviour Analysis, and how does it inform treatment approaches for children with autism in South Africa?

3.1. Introduction

This section provides a comprehensive review of the literature on Autism and early intervention strategies for children in South Africa. The aim is to explore the historical development of autism, examining how our understanding of the disorder has evolved over time. In addition, the review has delved into the various proposed causes of autism, tracing how these theories have changed and developed. The review has also taken a closer look at the causes of Autism and how the proposed causes have changed and developed over time. Furthermore, various methods of interventions for Autism, precisely the concept of Applied Behaviour Analysis, will be reviewed. A key focus was on Applied Behaviour Analysis (ABA), a widely used intervention approach, with an in-depth examination of its principles and effectiveness. The

theoretical framework guiding this study has l also be discussed, providing the foundation for the research. Finally, the section has concluded with a rationale for the proposed study, drawing on the insights gained from the literature review.

3.2. History

Autism Spectrum Disorders (ASD) are complex and broad neurodevelopmental conditions that affect various aspects of an individual's functioning (Masi et al., 2017). The Autism Association of South Africa describes autism as a developmental disability that makes it difficult for individuals to process and make sense of what they see or hear (Autism SA, 2018). The word "autism" is derived from the Greek term autos, meaning "self" (Exkorn, 2005). While the term is most commonly associated with Leo Kanner, it was first introduced in 1911 by Swiss psychiatrist Eugene Bleuler, who used it to describe patients he observed as being socially withdrawn and isolated (Exkorn, 2005; Kita & Hosokawa, 2011).

Since its initial description, the understanding and diagnostic criteria of autism have evolved significantly. In the 1940s, Kanner (as cited in Cook & Willmerdinger, 2015) characterized autism as the inability to relate to others and the world in a typical way from early childhood, distinguishing it from a subtype of schizophrenia and classifying it as a separate condition known as "Infantile Autism." In 1943, Kanner used the term "Early Infant Autism" to describe eleven children who exhibited disruptions in emotional connection and delays in language development (Kita & Hosokawa, 2011). By 1981, the behaviours associated with autism were categorized into three main clusters: (1) a lack of social interaction, (2) difficulties with understanding and using language appropriately, and (3) restricted and repetitive interests or behaviours. These clusters laid the foundation for the concept of the autism spectrum (Kita & Hosokawa, 2011).

3.3 Diagnostic History of Autism

The diagnostic criteria for Autism have evolved significantly since it was first identified in 1943. Initially, autism was considered a form of childhood schizophrenia, but this view was abandoned by 1979. It was then officially recognized as a distinct disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM), starting with the third edition (DSM-III; Wolff, 2004; McPartland et al., 2012; Verhoeff, 2013). However, the DSM-III included separate criteria for two distinct diagnoses: Infantile Autism and Childhood Onset Pervasive Developmental Disorder (Mazurek et al., 2017). In comparison, the later DSM-III-R version

allowed for a diagnosis of autism not only in infancy but also in childhood, as more evident delays in social interaction and communication appeared (Verhoeff, 2013).

Pervasive Developmental Disorders (PDDs) were used as an umbrella term to group various disorders marked by widespread challenges in communication, social engagement, and repetitive behaviours (Young & Rodi, 2014). Under the DSM-IV-TR, Autism Spectrum Disorders (ASD) were included within the PDD category, encompassing Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified. However, Rett's syndrome and Childhood Disintegrative Disorder were excluded from this category. McPartland et al. (2012) noted that including Asperger's Disorder in the DSM-IV contributed to a rise in autism diagnoses, as it identified individuals with high-functioning autism who had significant social and language difficulties, but were less impaired than those diagnosed with classic autism.

Despite its inclusion, McPartland et al. (2012) also pointed out that the inclusion of Asperger's Disorder led to confusion and misdiagnosis. Asperger's Disorder shared many similarities with Autistic Disorder, including at least two social symptoms and one stereotypical behaviour. However, Asperger's was distinguished by a later age of onset, no language delays, and no significant cognitive or non-social adaptive functioning deficits (McPartland et al., 2012).

The release of the DSM-5 marked a significant shift, consolidating ASD into a single, broad category and replacing the term Pervasive Developmental Disorders. The criteria for diagnosing ASD were refined: symptoms related to social and communication difficulties were combined and recognized as social-communicative deficits, and the inclusion of restrictive and repetitive behaviours, which had previously been excluded in the DSM-IV-TR, became part of the core diagnostic criteria (McPartland et al., 2012). The DSM-5 also streamlined the diagnostic process, requiring that all social-communicative symptoms be present, while only two out of four criteria for repetitive behaviour's needed to be met (McPartland et al., 2021).

Symptoms of ASD typically become noticeable in early childhood, often when parents or caregivers observe certain behavioural signs (Hess & Landa, 2012). However, it's common for these symptoms to go undetected for months (Matson et al., 2011), as it can be difficult for parents to pinpoint what might be wrong with their child (Matson & Goldin, 2014). Developmental delays often become evident around 19 months of age (Guinchat et al., 2012), and by the age of two, clear difficulties in areas such as play, language, social interaction, and sensory processing are typically recognized (Zwaigenbaum et al., 2009). More severe forms of

ASD are often diagnosed earlier (Matson & Goldin, 2014), while higher-functioning individuals with ASD may go undiagnosed until later in childhood (Turygin et al., 2014).

In detail, social attention and social communication behaviours that are in line with ASD include a decreased or non-existent ability to be oriented to their name or respond to it, reduced use of communicative gestures (Zwaigenbaum, Bauman, Stone, Yirmiya , Estes , Hansen 2015). Moreover, as individuals on the spectrum seemingly progress in language development, it may be a fluctuating gain and loss of skills and is often described as "odd" with inconstant inflection and volume of speech (Zwaigenbaum et al., 2015).

Moreover, an additional maker of temperament is atypical behaviours that include resistance to change, fixation, repetitive actions presumably associated with object use, general delays in gross and fine motor skills (Hirtz, Wagner, Filipek, & Sherr, 2017). How individuals on the spectrum modulate sensory stimuli may differ; some may prove diminutive or no reaction to pain or temperature, whereas others may prove increased distress to everyday stimuli such as noises or certain food textures as per the individuals trigger (Hirtz et al., 2017).

Owing to the varied and spectral nature of ASD in each individual, there is no irrefutable behavioural or diagnostic indicator of it prior to the age of 12 months (Zwaigenbaum et al., 2015). For instance, indicators and signs that are identified before the age of 12 months are not usually as reliable to predict a later diagnosis of ASD. This is especially true in children who present on the spectrum with very mild symptoms and may not be diagnosed until approximately preschool to school-going age. Controversially, (Zwaigenbaum et al., 2015 p.26) further emphasise that "Early identification of autism spectrum disorder is essential to ensure that children can access specialized evidence based interventions that can help optimize long-term outcomes and help shorten the stressful "diagnostic odssey" that many families experience before diagnosis."

A promising longitudinal study in the US is tracking infants at risk for ASD, whose older siblings have been diagnosed with the disorder. The study seeks to identify early signs that may precede an ASD diagnosis (Bölte et al., 2013). Early findings suggest that ASD-related behaviours typically emerge after the first six months of life (Fuentes et al., 2012).

Research supports the idea that the recognition of ASD symptoms follows a general pattern (Matson & Jang, 2014). Early concerns from parents usually focus on language delays, followed by issues with social skills and the presence of repetitive behaviours or restricted

interests (Kozlowski et al., 2011). Additionally, many parents report challenges with adaptive functioning, such as difficulties with sleep and feeding (Jang et al., 2014).

A recent study in the US indicated that primary caregivers' concerns emerge at similar ages across racial and ethnic groups (Jang et al., 2014). However, there is restricted investigation on how African cultural contexts influence the recognition of ASD symptoms, making it unclear whether culturally specific signs might appear in the early stages (DeWeerdt, 2012). Cross-cultural research has shown that the way early ASD features manifest can vary by culture. For instance, children with ASD in the US have been found to be more sensitive to sounds and sights compared to children in Israel (DeWeerdt, 2012).

3.3.1 Screening and Diagnosis of ASD.

There is an amount of elements that influence the nature of screening and diagnosing ASD. Take for example, the availability of resources, the time-consuming nature of the process that is dependent on the expertise of the professionals administering it and the assessment instrument selected. The intricate and multifaceted nature of ASD reflect on the screening and diagnosis as well. To elaborate, there is a need of qualified and experienced professionals that are not limited to but vary according to the nature of individual's developmental delays or concerns, "developmental-behavioural paediatricians, neurodevelopmental disability specialists, neurologists, psychiatrists, and psychologists, speech-Language Pathologists and Occupational Therapists" (Abubakar, Ssewanyana, & Newton, 2016,p.)

Although there has been a considerable amount of research undertaken on ASD predominantly in South Africa and Nigeria in the Sub- Saharan African Continent, the individuals/ communities at large remain poorly informed on the prevalence rates in the country. Thus, diagnosis remains a lengthy, time consuming, costly process with less equipped and experienced professionals countrywide.

3.4 Aetiology of Autism Spectrum Disorder

"Autism appears to be a family of diseases with common phenotypes linked to a series of genetic anomalies, each of which is responsible for no more than 2–3% of cases. The total fraction of ASD attributable to genetic inheritance may be about 30–40%." (Landrigan et al. ,2012, p.258). An extensive quantity of research has been steered on the sources of ASD. "Genetic research has received particular investment and attention (Autism Genome Project Consortium et al. 2007; Buxbaum and Hof 2011; Fernandez et al. 2012; O'Roak et al. 2011;

Sakurai et al. 2011) and has demonstrated that ASD and certain other NDDs have a strong hereditary component (Buxbaum and Hof 2011;" (Landrigan et al. ,2012, p.258), The aetiology of ASD remains relatively unclear, however, research shows that some of the causes may be genetics, biological and environmental factors. (Rutter, 2005; Zhang et al., 2010).

In addition, it is imperative to note that ASD is not correlated with a restricted, separate gene. Genetic investigations of ASD have identified a critical hereditary component (Landrigan et al., 2012). Genetic analysis has shown that the disorder is correlated with several genetic variations, genetic factors such as "mutations, deletions and other anomalies" are all associated with autism and only account for approximately 7-8% of all ASD cases (Sutcliffe, 2008, p.208). Only about 7–8% of all cases of ASD are caused by genetic variables, like as "mutations, deletions, and other abnormalities", which are all associated with autism (Sutcliffe, 2008, p.209). Rutter (2005) goes on to say that there are three to twelve prone to the genes for ASD, however, most siblings of students with autism may have some genes that are the same with their autistic students, they might not necessarily develop the condition. Studies reveal that siblings of individuals with autism have a relatively low risk of being diagnosed with autism – around 6% (Sutcliffe, 2008).

3.5 Comorbidity

Comorbidity is defined as having an occurrence of a secondary diagnosis/es to a primary diagnosis which can be in a form of mental or physical illness. According to the American Psychiatric Association (2013), "the DSM-5 estimates that approximately 70% of individuals diagnosed with autism spectrum disorder may display evidence of at least one comorbid mental disorder, with 40% displaying evidence of two or more comorbid disorders." Comorbidity is apparently evidentially greater propensity for in students with ASD than in people who are non-autistic (Al-Beltagi, 2021). Take for example, Al beltagi (2021, p.16) confirms that "patients with autism are 1.6 times more likely to have eczema or skin allergies, 1.8 times more likely to have asthma and food allergy, 2.1 times more likely to have frequent ear infections. 2.2 times more likely to have severe headaches, 3.5 times more likely to have diarrhoea or colitis, and 7 times more likely to report gastrointestinal (GI) problems".

In addition, there are multiple disorders that generally present as a comorbid disorder to Autism. The disorders are mainly categorised as 'Attention-deficit and hyperactivity disorder' (ADHD), and seizure disorder. Springer, Toorn, Laughton, & Kidd, (2013) conducted a study in the Western Cape with 58 autistic participants, the outcome conveyed that 25 participants

(43%) have been diagnosed with hyperactivity, inattention / and impulsivity. Furthermore, seizure disorder is prevalent in children with autism in partial complexities. Al beltagi (2021) asserts that the prevalence of complex partial seizures is 7-14 %. Common signs of complex partial seizures consist of prolonged staring, halting of activities, eye fluttering or deviation, and changes in behaviour linked to confusion, which is often resulted by sleepiness or fatigue (Bauman, 2010). Additionally, Bauman (2010) points out that recognizing seizures can be difficult due to the occurrence of unusual body movements and behavioural prototypes, which might not necessarily be linked to seizures but could be due to other medical issues.

3.6 Interventions used for ASD

3.6.1 Psychodynamic therapy

Psychodynamic therapy is a less intensive recognized treatment for ASD, it is a talk therapy aimed at gathering and understanding how a person's intuitive thoughts, feelings, and memories affect their behaviour. Psychodynamic therapy as a recommended treatment/ intervention for ASD was initially disseminated by Eveloff and Buttelheim (as cited in Matson & Minshawi, 2006).

3.6.2 Sensory Integration Therapy

Dawson & Watling, (2000) first introduced (SI) in 1972 by Anna Ayres and positioned importance on the affiliation between sensory involvements and interactive recital. Children with autism often present relatively high corporeal processing abnormalities which may include developmental delay(fine and gross motor skills), repetitive, rigid, or stereotyped behaviours, especially in childhood and infancy. Sensory integration therapy is a tailored approach bridging the sensory processing difficulties. Pfeiffer et al. (2011, p. 76) further states that "Children who present with a dysfunction of sensory processing often have trouble in regulating responses to sensations and specific stimuli, self-stimulation is often used to compensate for the limited sensory input and an attempt to avoid overstimulation."

Sensory Integration therapy intends to reinstate neurological processing in an effort to improve an individual's ability to integrate sensory information through utilizing targeted sensory interventions, including firm touch, movement, and texture exploration (Dawson & Watling, 2000)

3.6.3 Behavioural Interventions

The predominantly recognized method in treating children with Autism is known as the behavioural interventions. It targets to promote social, behavioural, and adaptive functioning. Matson & Minshawi, 2006 state that behavioural intervention aims to target problematic behaviours at an early stage. “Reports of intensive behavioural interventions from an as early age as 2-3 years proved that 47% of children improved their intellectual and educational functioning” (Magiati, Charman & Howlin, 2007 as citied in Govender, R. n.d.). Applied Behaviour Analysis is a derived method from behavioural intervention that is used in the treatment of Autism, and thus, a review of this method of intervention will follow.

3.6.4 Applied Behavioural Analysis.

The foundation of Behaviourism is founded on the work of John B Watson (1878-1958) who set the stage for the impartial analysis of behaviour. He was adamant that eliminating any mention of consciousness would lead to a more accurate description of psychological functions and behaviour in general (Learn behaviour, 2022). Until the early 1900s, psychology primarily focused on thoughts and feelings. Watson introduced behaviourism in 1913, emphasizing observable behaviour over internal mental states (Learn behaviour, 2022). Skinner expanded on this theory to explain how we learn based on antecedents and consequences. In the 1960s, researchers further developed the theories of teaching through ABA (Learn behaviour, 2022). Lovaas implemented a program using ABA to teach language to children with autism, leading to the creation of early intervention programs and the increased popularity of ABA. Initially, ABA interventions were rigid and intense, with hours of repetitive drills. However, the field evolved in the 1970s to become more naturalistic, child-directed, and engaging. Natural Environment Teaching (NET) incorporates ABA principles into daily routines, making treatment more practical and less clinical (Learn behaviour, 2022).

ABA has been recognized as an effective intervention for children with ASD because it puts an emphasis on not only helping the child master academic skills but also social and communicative skills, and tailoring ABA interventions to meet the distinctive challenges of students in South Africa is essential for successful outcomes (Dada & Alant, 2009). Several studies have emphasized the importance of cultural terms sensitive ABA interventions for students with ASD. For example, Dada & Alant (2009) emphasized the need to consider the cultural context in which students in South Africa are raised. They suggested that ABA interventions should be culturally relevant and consider the values and beliefs of the students

family and community. The above may assist in ensuring that interventions are meaningful and effective for students with ASD in South Africa. (Dada and Alant, 2009). The following child categories can benefit from the ABA teaching methodology: The conditions that fall under this category include ASD, delay in language development, challenging behaviours, children in mainstream schools who need counteractive education because they are falling behind in their studies, developmental delays in the domains of communication, cognition, or societal enthusiasm, ADHD, or any supplementary condition that is related to ASD (Magiati, Nel, &Joubert,2021).

Since then, ABA has evolved and developed into a systematic intervention approach for autistic students. It involves methodically employing intermediations based on the principles of learning models to enhance socially substantial behaviours. ABA is based on the understanding that behaviour is induced by the surroundings and can be modified through interventions that are systematically applied and evaluated. Theoretical positions of ABA are rooted in behaviourism, which emphasizes the role of environmental variables in shaping behaviour. ABA pursues to link the environmental features that impact behaviour and then design interventions to modify those factors and bring about positive change. This approach is supported by empirical evidence and has been demonstrated to be efficient in addressing a wide scale of symptoms in students with autism.

ABA can be implemented in two ways: “home-based intervention” and “centre-based intervention”. Home-based intervention involves an instructional program delivered and implemented within the home environment (Harris & Delmolino, 2002). In comparison, centre-based intervention takes place in a therapy or school setting (Harris & Delmolino, 2002). One key difference between the two approaches is parent involvement: home-based intervention requires a significant level of involvement from parents, while parent involvement is limited in centre-based intervention (Harris & Delmolino, 2002).

3.7 Techniques used withing ABA

3.7.1 Discrete Trial training

Discrete trial training is a organized and planned method used in Applied Behaviour Analysis (ABA), developed by Lovaas in the 1960’s, to educate individuals with autism by improving

their developmental and educational outcomes (Eikeseth, smith & Klintwall, 2014). It aims at breaking down proficiencies into little, controllable components, allowing for systematic instruction. (Eikeseth, smith & Klintwall, 2014, p.). This approach can only be applied in one on one teaching settings and cannot be implemented in a classroom or group setting. Eikesehth et al., (2014) as citied in Govender (nd, p.50) further stipulates that "DTT is a highly beneficial method of teaching as the duration of each trial is extremely small; therefore, approximately 10-15 trials can be implemented within one minute, therefore, allowing for an increased number of trials per stimulus." This strategy is inclusive of , rigorous direction (40 hours a week), table teaching, focusing on one skill at a time, ensuring that the student succeeds at least 30 % of the time (The star academy, 2024)

Prompting and fading are techniques that are used within Discrete Trial training. Prompting and fading are be better explained in the below example: Lebo does not know how to ride a bicycle, prompting is like training on how to ride a bike. The instructor provides temporary support to help Lebo find her balance and make the right choices. As she gains momentum, the instructor systematically removes those supports, or prompts, through a process called fading (The star academy, 2024)

3.7.2 **Natural Environmental Teaching**

Natural Environmental Teaching (NET), in distinction to discrete trial training, is a more natural- outside of the formal training setting - method of teaching that allows for incorporation of the students external environment into the education and is contingent to the interest of the learner. NET includes utilizing play; accustomed toys, games, and materials to maximize the learner's motivation to continue the activity and not only memorise the answers but display the applicability of the skill in real day-to- day life. For example, Bergstrom, Najdowski, & Tarbox, (2012) further elaborates that an example would include: teaching Lebo the function of a chair: sitting. Lebo might learn to say a chair is for sitting, but struggle to take direction when asked to sit. During a play segment with a doll house, the instructor may ask how a doll can sit at a table. If the child chooses the chair, they have demonstrated an understanding of the function in a natural play environment and generalized from the initial learning environment. This is how we can tell when a skill is truly mastered rather than memorized.

3.8 Conceptual Framework

Lee Vygotsky's theory was firstly introduced in (1928) initiating the theory of genetic law of cultural development. The development of children is commonly attributed as a dynamic progressive process, where individuals transition through consecutive developmental stages (Bodrova, 1997). "Vygotsky noted that a child's development cannot solely be attributed to their biological maturation. Rather, the development is dependent on the acquisition of the newly formed behaviours and the manner in which these were shaped" (Bodrova,1997, p.159). The theory does not prove to be necessarily merely aligned to the child's development but also the psychological and emotional development in correlation with the different acquired stages of development. Additionally, the theory of learning and development, states the role of culture and social interaction in shaping cognitive development, exploring the "relationship between language, thought, and cognitive development", introducing Vygotsky's concept of the "zone of proximal development" (ZPD). that social interactions are fundamental in a child's development and that these are socially guided and constructed (Kozulin, 2004).

The Zone of Proximal Development can be defined as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peer" (Shabani, Khatib, & Ebadi, 2010, p. 86). The Zone of Proximal Development (ZPD) was introduced to help us understand how a child's learning connects with their mental growth. It highlights how both genes and social experiences play a big role in shaping how kids learn and think (Wertsch, 1979). Vygotsky also pointed out that kids' cognitive development happens through social interactions, and that the most important learning happens when they work within their ZPD, which is a space where they can solve problems with a little help from others.

For example, think about a 7-year-old named Lebo, who has autism. Lebo might struggle to tie his shoes on her own, but with a bit of guidance from a instructor, she can start to learn the steps involved. This process of getting help, while still being challenged, is part of his Zone of Proximal Development, where she's ready to learn but needs support to make progress. (McLeod, 2014). Moreover, the link between education and development is displayed in Vygotsky's idea of ZPD.

In addition, Shabani, Khatib, & Ebadi, (2010, p.239) "believes that as a first step for understanding how Vygotsky formulated the zone of proximal development, it is important to

remember that Vygotsky's interest is to develop a theoretical basis for appropriate pedagogical interventions, including principles for possible instructional grouping of learners and identification of specific interventions for individual learners. Interventions must be based on diagnostic procedures based on a learner's current state of development." Furthermore, it is indicated that in order to develop a valid basis for practical prescription, individualized plan and intervention the diagnosis must provide an explanation and prediction.

Thus, demonstrating that the child's environmental factors influences their construction of knowledge. Vygotsky's theory of learning and development is predicated on the idea that lower mental functioning—like linked memory and sensation—are presumed to exist from birth and that maturity and the development of life experiences determine how these functions develop (McLeod, 2014). Furthermore, higher mental functioning are considered to be influenced by culture and may vary amongst individuals (McLeod,2020). In addition, "the theory of learning and development states that a child's learning and development occurs through the interaction between the child and the teacher or parent, whereby the parent or teacher models the desired behaviour or provides verbal instruction, which the child then attempts to demonstrate. Over time, the child internalises this behaviour or instruction and begins to demonstrate the desired action independently". (McLeod, 2014, p.)

Furthermore, the theory's emphasis on social interaction and the child's environment directly interrelates with how ABA utilises structured, repeated interventions that focus on behaviour modification within real-world contexts. Autistic children display considerable deficits in both higher and lower mental functioning. Applied Behaviour Analysis interventions aim to compensate, build and develop these areas of functioning.

How does the Applied Behaviour Analysis model specifically address each functioning domain for learners with autism in the South African context?

3.9 The dominant themes of ABA

The dominant themes of applied behavioural analysis that will be discussed are the Targeting of the Domains of functioning within the ABA model; Application of the ABA model; Targeting of Behaviour Management within the ABA model in addition to the Assessment of Progress Achieved as a result of the ABA Model.

3.9.1 Targeting of the domains of functioning within the ABA model

ABA model targets the acquisition of skills across all eight domains of functioning which are namely “academic, adaptive, cognitive, executive, language, motor, play and social”. In Vygotsky's model, education does not coincide with development. However, it is constructed in such a way as to develop those psychological functions that will be needed for the next educational step. Preference is given to communication and enhancing the child’s range of vocabulary in addition to enabling the child to be able to engage across multiple social contexts.

What are the key factors that contribute to the effective application of the ABA model for learners with autism in South African schools?

3.9.2 Application of ABA model

“Vygotsky notes that during the development period, the learner remains relatively passive, and the learning outcomes are determined by the nature of stimuli” (Bodrova, 1997; Topçiu & Myftiu, 2015). He further elaborates on following a holistic approach encouraging the interconnectedness of learning (student), teaching (teacher) and the environment (social entity). Furthermore, the application of the ABA model emphasises permitting the learner to remain an active participant throughout the learning process and further elaborates that learning and the acquisition of new skillsets transpire in a method where the development of various skillsets are attained concurrently (Roane et al., 2016). With this being said, Natural Environmental Training fosters this holistic approach by assisting learners in developing skills that can be applied in real-world situations across different domains. By bridging the gap between learning and everyday life and embracing this interconnectedness, learners can cultivate a more nuanced, adaptable, and resilient approach to learning.

3.9.3. Targeting of Behaviour Management within the ABA model

Behaviours such as tantrums, hostility, non-compliance in addition to vocal assertion are the most classified as the most prevalent behaviour. Behaviour management in ABA involves strategies used to decrease inappropriate behaviours (e.g., aggression, self-injury, tantrums) and increase desired behaviours (e.g., following instructions, using communication).

Take for instance***: Antecedent (A):*** The teacher announces that it's time for a literacy/reading lesson. Lebo starts to feel anxious and overwhelmed by the prospect of reading, spelling or expressing herself.

Behaviour (B): Lebo throws a tantrum, refusing to sit down or participate in the lesson. She continues to yell and scream, disrupting the rest of the class.

Consequence (C): The teacher stops the lesson and tries to calm Alex down. Alex gets attention from the teacher and peers, which can reinforce the tantrum behaviour.

Behaviour Management Strategy:

Antecedent Intervention: Provide Lebo with a visual schedule and a warning before the literacy lessons, to help reduce anxiety and prepare for the transition. Offer positive reinforcement, such as stickers or stars, for calm behaviour during the reading/ literacy lessons. In addition, the antecedents ought to be changed and consequences to increase appropriate behaviour. Consequences that follow a behaviour will increase or decrease the behaviour. What will happen to the future frequency of this crying behaviour?

Behaviour Modification Plan: Teach Lebo alternative behaviours, such as deep breathing or counting, reciting alphabets to replace the tantrum behaviour and when she practices the replacement, offer positive reinforcement to reward the behaviour. In relation to effectively carrying out the intervention, consistency is Key between instructors, other professionals and parents/caregivers.

3.9.4. Assessment of Progress Achieved as a result of the ABA Model.

Reflecting Vygotsky's notion of social learning allows the assessment of progress maintenance in Applied Behaviour Analysis (ABA) and reveals that newly acquired skills are maintained over time, and accommodating communication with others is progressed. Continuous engagement with newly acquired skills should be facilitated through structured progress analysis. However, the ABA method has limitations, as it does not accommodate the process of scaffolding, which allows for the natural extension of skills and knowledge.

The findings from collecting data during lessons have implications for behaviour management, highlighting the importance of using structured progress analysis to inform behaviour management strategies and ensure that newly acquired skills are maintained and built upon. Furthermore, the development of cooperative dialogues with others can be leveraged to promote social skills and reduce problem behaviours. Ultimately, a more holistic approach to behaviour management is necessary, one that incorporates scaffolding and other evidence-based strategies to promote long-term progress and development.

“The provision of reinforcement to increase the rate of desired behaviours is a crucial element of behaviour analytic intervention for individuals diagnosed with autism spectrum disorder (ASD).” (Oppenheim-Leaf, 2018, p.69). There are a number of critical components of an assessment for use in ABA programs, Sandberg (2008) explores five important components to consider when selecting the assessments. Firstly, ‘Comprehensive Assessment’, assessment should cover all areas of a child’s development, including social, motor, language, daily living, play, and academic skills. This will ensure that all important areas are not omitted when setting objectives and developing a personalized curriculum (Sandberg, 2008). Secondly, the necessity of focusing on Early Childhood Development, the assessment ought to be appropriate for children as young as 6 months and regulated in anticipation of when the children are ready for regular education- first or second grade (Sandberg, 2008). Tools have to be applicable for the child’s age and reflect typical development stages. Thirdly, ‘considering behaviour Function’, “the assessment should look at the function of a child’s behaviour, not just what the behaviour looks like. A child’s behaviour may serve different purposes, and each function may need separate teaching. The assessment should be tailored to the child’s strengths and developmental needs.” (Sandberg,2008, p.992).

Fourthly, there is a need for a ‘constant link to Curricula Targets’, the assessment should focus on specific behaviours or skills. “Behaviour analytic interventions are built on operationally defined target behaviours. If assessment items target behaviours or skill areas that are too general, they will not yield sufficient information to guide the design of individualized EIBI curricula (i.e., further assessment would be needed in order to 992 E. Gould et al. / Research in Autism Spectrum Disorders 5 (2011) 990–1002 determine exactly what to teach and where to start teaching skills)” (Sandberg,2008, p.992). Moreover, asking conventional questions that are not related to the specific targeted behaviours won’t provide enough guidance for designing individualized curricula. It’s important to identify specific skill strengths and weaknesses to know exactly where to start teaching (Sandberg, 2008). Lastly, ‘tracking Progress Over Time’ the assessment should allow for ongoing measurement and help track the child’s progress throughout the intervention. It should be easy to administer, cost-effective, and efficient so it can be used repeatedly without being difficult for the instructor (Sandberg, 2008).

Furthermore, there are multiple assessment plans and procedures that may be utilized when applying ABA, which are namely The Verbal Behaviour Milestones Assessment and Placement Program **(**VB-MAPP**)** (Sundberg, 2008) , and the Assessment of Basic Language and Learning Skills®-Revised (Partington, 2010) and A Functional Behaviour Assessment (FBA) (Partington, 2010). However, for the purpose of this study to determine skill acquisition goals and objectives, only two assessment plans will be explored (The Verbal Behaviour Milestones Assessment and Placement Program VB-MAPP- which targets skills or in particular the domains of functionality and A Functional Behaviour Assessment -FBA that address challenging behaviours) will be explored in relation to using ABA as an intervention for autistic children (Sundberg, 2008). The VB-MAPP assessment looks at milestones "language skills such as mand, tact, echoic, social play", broken down by developmental stages: 0-18 months, 18-30 months, and 30-48 months (Sundberg, 2008). Additionally, it identifies and access "24 potential challenges" to learning and language, including addressing issues in the Milestones areas, prompt dependency, and social skills. If any barriers are found, more formal assessments may be needed (Sundberg, 2008).

Sundberg, (2008) further elaborates that the transition Assessment helps determine if the child is making enough progress to move to a less restrictive environment. By combining Milestones and Barriers scores, along with social and daily living skills, it helps educational teams decide on appropriate school placement. Then Task Analysis and Skills Tracking incorporates nearly 900 skills to help instructors target necessary abilities. It also provides activities to help maintain and generalize these skills across different environments. The final stage comprises of placement and IEP goals that helps identify goals for the client's IEP or treatment plan, using formal testing, observation, or timed observation. The assessment results categorize skills into three levels of need (Sundberg, 2008).

A Functional Behaviour Assessment -FBA focuses on addressing challenging behaviours in autistic children. It initially works with identifying triggers for autistic prone social, academic or physical challenging behaviours (antecedents) and reinforces (consequence) of the behaviour and then suggesting positive reinforcement replacement behaviours (Oppenheim-Leaf, 2018).The main purpose of this assessment treatment is to understand why and how a certain behaviour occurs then using that information to create an effective plan targeting the triggers (Oppenheim-Leaf, 2018). It comprises two components: indirect assessment

(secondary gathering information through interviewing parents, teachers and child understanding when and how the behaviour occurs) (Oppenheim-Leaf, 2018). Direct assessment primary data where the behaviour is observed in its occurrence and data is collected- enabling identification of patterns surrounding the behaviour and the environment (Oppenheim-Leaf, 2018).

"Despite the strengths of these assessments, some concerns warrant discussion. For one, there is no single assessment that is comprehensive enough to be used for developing a fully comprehensive ABA curriculum for a child who has deficits across all developmental domains. Assessments used for the purpose of intervention planning must ''identify specific skills that are either present or absent from the person's repertoire, appropriate or inappropriate, and effective or ineffective'' across all skill domains (Sigafoos et al., 2008, pp. 169–170). However, within the history of assessment development for this population, assessments have been designed by individuals from differing perspectives with an emphasis on specific features of ASD; thus a comprehensive assessment designed to measure all areas of human functioning has not been established (Richdale & Schreck, 2008)" (Sundberg, 2008, p.999)

3.9.5 Treatment Hours

Lovaas (1987) initially conducted a research and suggesting that the appropriate number of hours for an effective intervention would be 40 hours per week. For the reason that the applicability of ABA is majorly determined by the duration and frequency of applying the intervention. The more intensive and regular- the better or improved treatment outcomes, Granpeesheh et al. (2009), further support the above by illustrating the nature of the progressive linearity relationship between the treatment hours and the child's age (the early they start the treatment).

Areas of controversy in the literature review

Critiques stated that the early ABA methods, in the 1960s, employed aversive techniques such as electric shock, slaps, or loud noises to eliminate unwanted behaviour. Although such practices have been for the most part disavowed, their shadow still casts ethical doubts on ABA's capacity to induce psychological injury or violate autonomy (Lovaas, 1987; Wilkenfeld & McCarthy, 2020). In addition, ABA has been criticized for its focus on neurotypical

conformity through the teaching of stimming suppression or forced eye contact rather than accepting autistic self-expression (McGill & Robinson, 2020). Autistic activists contend that such conformity can be dehumanizing, comparing ABA to a type of "conversion therapy". The neurodiversity movement stresses that autism is an acceptable neurological variation, not a defect to be "normalized"(McGill & Robinson, 2020).

Most previous recipients experience enduring emotional suffering or trauma, including symptoms similar to PTSD (Leaf, Ross, Cihon, & Weise,2018). These are particularly severe where ABA is focused more on compliance than on emotional well-being and self-determination (McGill & Robinson, 2020). Critiques, furthermore, contend that ABA tends to overpower a child's uniqueness and autonomy, altering behaviours to the detriment of personal identity development (McGill & Robinson, 2020). Bioethicists caution that in such situations, ABA can violate autonomy and non-maleficence principles (McGill & Robinson, 2020).

Sandbank, Bottema-Beutel, Crowley, Cassidy, Dunham, Feldman, & Woynaroski, (2020) further assert that a significant proportion of ABA studies use single-case experimental designs (SCEDs), which lack the comparative rigor of randomized controlled trials. Sandbank et al. (2020) found that over 75% of studies evaluating ABA showed a high risk of bias, raising concerns about the strength of its evidence base.

In addition, Faheem, (2024) state that ABA is intensive, sometimes taking 20-40 hours per week a huge strain on families and children. Some argue that that level of intensity can diminish the likelihood of experiencing typical childhood experiences or be unfeasible in settings with limited resources. For autistic children who need milder support, ABA is not as effective or even limiting. Developmental play therapy or multidisciplinary intervention can perhaps best meet their needs (Pillay & Girdwood, 2020).

In South Africa, ABA is heavily marketed and utilized in schools and therapy centers. Some providers ignore the complaints of autistic individuals, while others proactively distance themselves from ABA or combine eclectic methods (Melnyczuk, 2022). Interestingly, organizations that apply ABA have also been promoting harmful drugs such as chlorine dioxide (MMS), although these overlaps are not common for all practitioners (Pillay & Girdwood, 2020).

3.10 Summary

In conclusion, this section has explored key research on Autism, early intervention strategies, and the application of Applied Behaviour Analysis (ABA), along with its domains and assessment approaches. Guided by Lev Vygotsky's theory of learning and development, which underscores the significance of social interactions in a students development, the proposed study aims to evaluate the effectiveness and suitability of ABA as an early intervention method within the South African contextCHAPTER 4: GLOBAL AND LOCAL APPLIED BEHAVIOURAL ANALYSIS STUDIES.

4.1 Introduction

This chapter explores the wide-ranging research on the effectiveness of (ABA) in promoting positive outcomes for students with autism. Furthermore, it examines the global studies that have consistently demonstrated the efficacy of ABA, as well as the specific research conducted in South Africa. Conclusively, it discusses the framework of policies in South Africa aimed at supporting inclusive education and exploring the potential implementation of ABA within this framework.

4.2. Global Applied Behavioural Analysis Studies.

In the United States, ABA has been extensively acknowledged as an efficient treatment for individuals with autism. It has been endorsed by the 'Surgeon General', 'The American Academy of Paediatrics', and 'The National Institute of Mental Health', among others (Slocum et al., 2014). ABA has also gained support through legislation, including coverage by many insurance companies and individual states mandating coverage for ABA therapy. In the UK, ABA has also gained traction as an effective treatment autistic students. The National Institute for Health and Care Excellence (NICE) in the UK has recommended ABA for children and young people with autism based on indication of its effectiveness (National Institute for Health and Care Excellence, 2013).

In addition, Choi, Bhakta, Knight, Becerra-Culqui, Gahre, Zima, & Coleman, (2022) in South California carried out a retroactive study which examined the outcomes 4145 students with ASD referred for ABA therapy between 2016 and 2018 yielded valuable insights. From this group, 334 children were randomly selected for closer examination. The findings showed that nearly 1 in 7 children (13%) failed to initiate ABA therapy after referral. In contrast, two-thirds (66%) of the children began ABA and persisted for at least a year, but only about half (46%) continued for the entire 24-month period. The study also revealed that children with prior

special education experience tended to engage in ABA for longer periods, whereas those from single-parent households were more prone to discontinuing therapy. Interestingly, despite only 28% of children receiving the complete recommended ABA regimen, even those with the most severe symptoms exhibited substantial gains in adaptive behaviour after 24 months.

Several global studies have verified the efficiency of ABA for individuals with autism. For example, Eldevik et al. (2009) conducted in Norway found that autistic students who received early and intensive ABA therapy demonstrated increases in cognitive and adaptive skills, as well as reduced core autism symptoms. In a study by Dawson et al. (2010) conducted in Australia, it was found that children who received early intensive ABA therapy demonstrated considerable gains in IQ, language, and adaptive behaviour compared to a control group. These studies, along with many others, demonstrate the global relevance and effectiveness of ABA as a treatment for individuals with autism.

One recent study conducted in Sweden by Johnson et al. (2021) examined the outcomes of ABA therapy for students with autism. The researchers found that students who received ABA therapy showed significant developments in communicative skills, social interactions, and adaptive behaviours. The study concluded that ABA therapy was an effective intervention for children with autism in Sweden. Additionally, in a study conducted in Africa by Odu et al. (2022), the authors examined the effects of ABA therapy on children with autism in the region. The findings revealed that children who underwent ABA therapy demonstrated improvements in play skills, following instructions, and reducing maladaptive behaviours. The study supported the efficacy of ABA therapy for students with autism in Africa.

Moreover, a recent study in Ireland by Murphy et al. (2023) focused on the impact of ABA therapy on students with autism in the country. The scholars found that ABA therapy led to considerable increases in behavioural issues, cognitive functioning, and academic performance in children with autism. The study highlighted the progressive results of ABA therapy for autistic children in Ireland. Respectively, according to Bakare and Munir (2011), Egypt and Tunisia have recorded ASD prevalence rates of 33.6% and 11.5%.

On a global and local level, ABA has significant relevance with respect to autism. In the United States, ABA is contemplated the ‘gold standard’ for treating individuals with autism, and it is

widely recognized and utilized in many other countries as well. The principles and techniques of ABA have been applied to various settings, including schools, homes, and community-based programs, to address the unique needs of individuals with autism. In recent years, there has been increasing recognition of the global relevance of ABA in addressing the needs of individuals with autism. ABA has been adapted and implemented in diverse cultural and linguistic contexts, demonstrating its applicability across different populations. Additionally, ABA has been shown to be effective in addressing the core symptoms of autism and improving adaptive behaviours and functional skills in individuals with autism. Additionally, according to Baxter et al. (2015), the estimated prevalence of ASD is 1.7% in South Korea and 0.02% in Norway. Raina et al. (2015) discovered that there is a 1:2 increase in autism diagnoses was observed among children in India, where study on the condition had previously been limited to hospital or selected settings.

The demand for Applied Behaviour Analysis (ABA) treatment surged in the United States and the United Kingdom in the 1990s. Over the past 60 years, ABA has been widely recognized as "the primary treatment for brain injury, autism spectrum disorders, and other developmental disabilities" (Axelrod et al., 2012, p.13). In countries like Australia, Canada, and the United States, ABA is considered the preferred method of treatment for Autism and has received government support (Welch & Polatajko, 2016). In South Africa, non-profit organizations offer support services to families with children with ASD, including ABA, PECS (Picture Exchange Communication System), and Makaton, a language program that uses signs and symbols for communicative skills (Franz et al., 2018).

Additionally, in India, "tertiary care medical centres, hospitals, and clinics, as well as various NGOs enlisted under the National Trust Act, provide treatment and care for autism. Research in autism is being carried out in these care settings as well as in technological institutes, educational establishments, research centres, and yoga & alternative care settings." (Patra & Kar, 2021, p.82). Moreover, Action for Autism, an Indian NGO, initiating in 1991 by parents in India, provides valuable insights into Applied Behaviour Analysis (ABA) in developing countries (Patra & Kar, 2021). The organisation is a multifaced dimensional focusing on raising awareness, implementing early Intervention, offering specialized educational programs, conducting diagnostic assessments, fostering vocational training and employment opportunities for adults with autism, independent living, and creating awareness about autism

(Patra & Kar, 2021). While they don't explicitly state their stance on ABA, information can be gathered from this approach as it stems from a similar organization and research studies on ABA.

While ABA is often a standalone therapy in the U.S. and other Western countries, in India, it is integrated within a broader support system that includes cultural considerations, family involvement, and other localized strategies (Patra & Kar, 2021). The scale of ABA implementation in India is not as vast as in countries like the U.S. or the UK, where ABA is often a standard practice in many educational and clinical settings (Patra & Kar, 2021). However, AFA's work is gradually expanding awareness and increasing access to ABA therapies in India (Patra & Kar, 2021).

ABA is highly effective due to ample resources in high-income countries, a large number of trained professionals, comprehensive support systems, access to technology, as video modelling or computer-based applications for teaching enhancing the effectiveness of ABA. Children with ASD benefit from both DTT and NET, as these techniques are tailored to meet the individual needs of each child (Yingling, Ruther, & Dubuque, 2022).

Despite the advantages, some argue "that the structured nature of DTT might limit the development of spontaneity and natural social interaction, as children may become overly reliant on prompts." (Yingling, Ruther, & Dubuque, 2022, p.5484). The nature of ASD being different in every individual may in turn prove ABA as too rigid for some children who tend to be more flexible and contrary thrive in a creative stomatous environment. Additionally, the use of techniques such as DTT, can be extremely time-consuming (Yingling, Ruther, & Dubuque, 2022).

Moreover, in medium-income countries, therapists use NET to provide a more flexible, contextually relevant approach which may be relatively seen as effective. Parents and caregivers in these regions often play a significant role in the therapy, making ABA more accessible even when professional resources are limited (Yingling, Ruther, & Dubuque, 2022). The flexibility of NET allows for teaching in real-life contexts, which may be particularly important in low-resource settings where formal therapy sessions might be fewer (Yingling, Ruther, & Dubuque, 2022).

In medium income countries, there is an inconsistent quality of training available for instructors or practitioners. This discrepancy in expertise can lead to variations in the quality of

interventions, hence lowering effectiveness of applying the intervention(Yingling, Ruther, & Dubuque, 2022). Furthermore, many medium-income countries face infrastructural challenges, such as limited access to educational support or technology, which can hinder the full implementation of ABA techniques. Additionally, some families may not have the financial resources to sustain long-term ABA interventions (Yingling, Ruther, & Dubuque, 2022).

Furthermore, in low-income countries, ABA's effectiveness depends heavily on the creativity and resourcefulness of the therapists and caregivers(Yingling, Ruther, & Dubuque, 2022). Local therapists may use ordinary activities for NET or simple items to deliver DTT. In these situations, parents also frequently have a significant impact on their kids' education. Because of NET's adaptability, kids can learn in their natural settings, which may make interventions more widely available (Yingling, Ruther, & Dubuque, 2022).

The foremost obstruction to implementing ABA in low-income countries is the lack of formal training, low resource/ budget and educational infrastructure. The effectiveness of ABA will be severely compromised due to the lack of sufficient trained professionals or instructors (Yingling, Ruther, & Dubuque, 2022). Furthermore, cultural differences in the understanding of autism may result in resistance or misunderstanding of ABA principles. Additionally, in many low-income countries, there is a lack of institutional support for children with ASD, making it difficult to provide consistent interventions. "To ensure the best outcomes, it is essential to address barriers that may hinder referral and initiation rates. Improving access to ABA therapy and providing support for families can help increase the likelihood of initiating and continuing therapy." (Choi et al., 2022, p.8)

For each income cluster, ABA interventions must be tailored to local contexts, with a focus on maximizing available resources and ensuring that interventions are culturally appropriate and accessible. By addressing these challenges, ABA can remain a valuable therapeutic tool for children with ASD, regardless of a country's economic status.

Conclusively, ABA has been rigorously researched in high-income nations, with the United States being particularly prominent, where it is the gold-standard treatment for Autism Spectrum Disorder (ASD). There is a considerable amount of evidence demonstrating ABA's efficacy at fostering communication, social skills, and diminishing maladaptive behaviours (Schreibman, Dawson, Stahmer, Landa, Rogers, McGee, & Halladay, 2015). Controversies regarding ethical issues, under-autonomy, and over-normalization (Wilkenfeld & McCarthy,

2020). Growing popularity of naturalistic development approaches as an alternative or complement to more intensive interventions of ABA (e.g., Early Start Denver Model).

What emerges from this body of literature, in the researcher's interpretation, is tension between structured intervention and personal dignity. While ABA is shown to be effective in specific behavioural outcomes, it often leaves unexamined the emotional experiences of autistic individuals themselves. As such, global research both affirms ABA's utility and calls for its evolution.

4.3 South African ABA Studies

"Autism is a grand challenge in global mental health to be dealt with on a priority basis. Phenotypic knowledge, biological understanding, and evidence-based intervention studies are all from western countries. We know very little about autism in the low- and middle-income countries (LMIC). Lack of infrastructure and difficulties in operationalizing research has widened the knowledge gap" (Patra & Kar, 2021, p.81)

Furthermore, research has shown that ABA interventions can be adapted to adjust the diverse language and communication needs of children with ASD in South Africa. For instance, Balandin and Iacono (2009) emphasized the importance of using alternative and augmentative communication (AAC) strategies within ABA interventions to support the communication needs of children with ASD. This is particularly important in a country like South Africa, where children may speak different languages and have varying communication abilities.

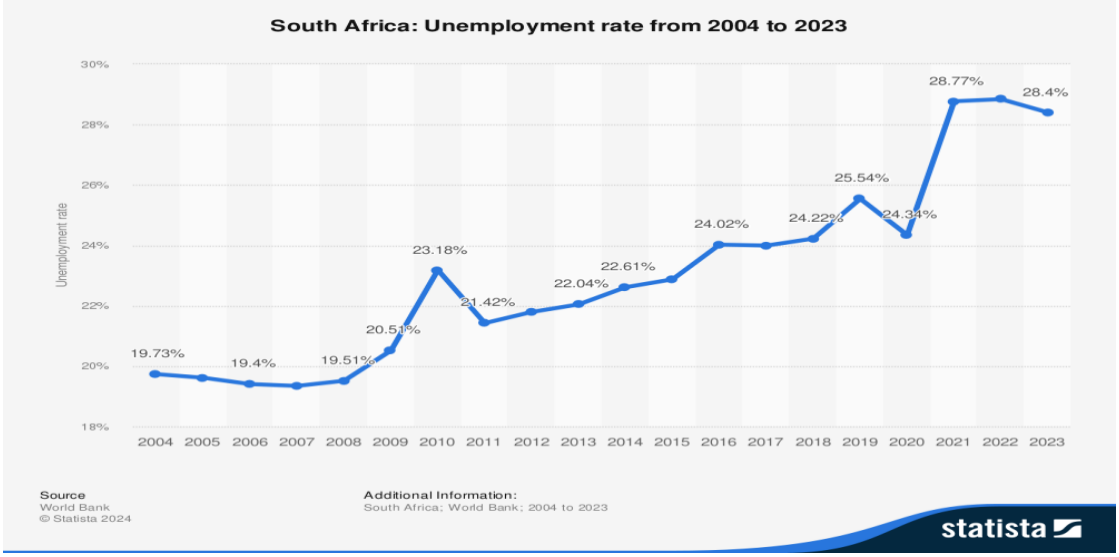
In addition to cultural and communication considerations, it is important to tailor ABA interventions to meet the individual preferences and strengths of students with ASD in South Africa. For example, Ndlovu and Edwards (2013) highlighted the importance of incorporating child-led activities and interests within ABA interventions. By doing so, autistic children are more likely to engage in and benefit from the interventions, ultimately leading to better outcomes. Overall, tailoring ABA interventions to meet the needs and partialities of students with ASD in South Africa is fundamental for successful outcomes. By considering cultural, communication, and individual factors, ABA interventions can be more effective in supporting

the development and well-being of autistic students ASD in South Africa (Ndlovu and Edwards, 2013).

Additionally, there are cultural and socio-economic factors that may affect the experiences and needs of children with autism in South Africa. Many communities in South Africa continue to lack knowledge and awareness regarding autism. Children with autism may experience discrimination, stigma, and misunderstandings, all of which may limit their access to support and services (Pascoe, Kantor, and Fanderlinden,2019).

There is a severe lack of resources for autistic children in South Africa, including facilities, qualified personnel, and support services. For children with autism, this lack of resources may restrict their access to early intervention and suitable therapy. Autism diagnosis is difficult in South Africa (Franz et al., 2018). Since many medical professionals are unaware of autism, they are afraid to diagnose it and avoid doing so (Axelrod, McElrath, & Wine, 2012). A significant portion of the curriculum in medical school emphasizes excluding autism from diagnosis. Additionally, there is an antiquated propensity to refer to it as a neurological illness and deem these children retarded, even though we know that it is a biological disorder that can be treated (Axelrod, McElrath, & Wine, 2012). The execution of intensive programs supervised by highly qualified specialists provides most of the confirmation supporting the efficiency of early ASD intervention. In contexts with limited resources, these best practices create issues related to sustainability and practicality, as well as substantial implementation costs (Guler et al., 2017). Supporting this, Guler (2017, p.1) asserted that, “The development and validation of autism spectrum disorder interventions has almost exclusively occurred in high-income countries, leaving many unanswered questions regarding what contextual factors would need to be considered to ensure the effectiveness of interventions in low-income and middle-income countries”.

According to Statistics South Africa (2023), “The population of South Africa is estimated to be 60,6 million by the end of June 2022. Between 2002 and 2022 South Africa experienced a positive population growth year-on-year.” The unemployment rate in SA as of the first quarter of 2023 is 28.4%. It is also reported that 55.5% of the population in South Africa is living below the poverty line, based on the national poverty lines, as stated by Statistics South Africa (2023), (Unemployment Rate in South Africa 2023, 2024).



The graph above indicates that South Africa is a nation marked by social and economic disparities and these disparities limit access to ABA assessment and intervention services.

Applied behaviour analysis (ABA) is considered the gold standard in interventions for students with autism spectrum disorder (ASD) worldwide, including in South Africa. ABA is a scientific method to comprehending and modifying behaviour, focusing on the principles of learning theory to promote positive behaviours and reduce problematic behaviours in individuals with ASD (American Psychological Association, 2020). ABA interventions are individually tailored to each child's specific needs and are typically delivered by trained professionals, such as board-certified behaviour analysts. In South Africa, there is a growing recognition of the importance of ABA in the treatment of children with ASD. However, access to ABA services can be limited due to numerous aspects, with a lack of trained professionals, financial constraints, and geographical barriers. As a result, many families struggle to access ABA interventions for their children with ASD.

Despite these challenges, there are efforts being made to enhance the availability and quality of ABA services in South Africa. Organizations are working to promote the use of indication-based practices, including ABA, in the treatment of children with ASD. Additionally, training programs for behaviour analysts are being developed to increase the number of professionals qualified to deliver ABA interventions in the country. While there are still challenges to be overcome, the landscape of ABA interventions for children with autism in South Africa is evolving. With continued efforts to promote the use of evidence-based practices and increase

access to trained professionals, it is hoped that more children with ASD will be able to benefit from ABA interventions in the future.

South Africa has a significant population of children with ASD. According to a recent study, the estimated prevalence rate of ASD in South Africa is 6.5 per 10,000 children, which is similar to rates reported in other countries (Malda, Els, & Nel, 2016). Additionally, the lack of resources and trained professionals in South Africa adds to the challenges faced by children with ASD and their families. ABA can be particularly relevant in this context as it is a flexible and adaptable approach that can be implemented by trained professionals as well as parents and caregivers (Ozonoff et al., 2018).

The relevance of ABA in the South African context is also supported by research evidence. A study by Magiati et al. (2021) demonstrated the effectiveness of ABA in improving adaptive behaviours, social skills, and communication in children with ASD in a South African setting. Furthermore, the study reported that the gains made through ABA intervention were sustained over time, highlighting the long-term benefits of this approach.

In addition to its effectiveness, ABA is also relevant in the South African context due to its cultural sensitivity. ABA programs can be tailored to meet the specific needs and cultural backgrounds of children with ASD in South Africa, which is crucial for the success of any intervention (Lloyd & Tareen, 2022). A culturally sensitive approach ensures that the intervention is meaningful and relevant to the child and their family, increasing the likelihood of positive outcomes. Furthermore, the relevance of ABA in South Africa is also supported by the fact that it aligns with international best practices for the treatment of ASD. The World Health Organization (WHO) has recognized ABA as an evidence-based practice for children with ASD, and its relevance has been demonstrated in diverse cultural and geographical contexts (World Health Organization, 2020).

The relevance of using ABA for autistic children in South Africa cannot be understated. The evidence-based nature of ABA, its effectiveness in improving outcomes for children with ASD, its cultural sensitivity, and its alignment with international best practices make it a highly relevant and valuable approach for the treatment of ASD in South Africa. With the increasing recognition of the importance of early intervention for children with ASD, ABA has the

potential to make a significant impact on the lives of autistic children and their families in South Africa.

In the South African environment, this theoretical basis is often brought in without a sufficient level of adaptation to local systemic, linguistic, and cultural contexts. Little empirical work has been done on how ABA models are being localized and practiced in a sustainable and ethical way (Pillay & Girdwood, 2020). Few studies have been conducted in South Africa on how ABA meets core areas of functioning such as: communication and language development, social interaction, cognitive and adaptive skills, behavioural regulation. Wherever ABA is implemented, these areas are typically tackled by extremely structured techniques such as Discrete Trial Training (DTT) and Verbal Behaviour Therapy. But instead, indications are towards piecemeal use with interventions being carried out in non-governmental, urban areas and without standardized assessment or evaluation (Faheem, 2024).

With the above analysis, the researcher interpreted that there's a visible disconnect between global evidence and local practice. While South Africa has pockets of excellence in autism intervention, these are largely inaccessible to the majority. The potential of ABA is not in question—but its sustainability, equity, and cultural relevance are. This opens a crucial space for South African researchers and practitioners to develop context-adapted ABA models that work within the country's real constraints and cultural frameworks. Additionally, what is notably missing from South African literature is an exploration of how ABA addresses the developmental domains of learners—such as language, cognitive ability, social interaction, and adaptive functioning—in diverse school contexts. Anecdotal success stories exist, but they are not backed by longitudinal or comparative studies.

4.4 Educational Policy Frameworks in South Africa

"The right to basic education is universal, and its realisation is mandatory for all children (Strohwald 2021). The basis of children's rights, specifically the rights of children with disabilities, is entrenched in the Convention on the Rights of Persons with Disabilities (CRPD), African Charter on the Rights and Welfare of the Child (ACRWC) and Convention on the Rights of the Child (CRC)." (Chirowamhangu, 2024, p.3). Although the right to education has

been clearly stipulated worldwide, there is a lack of legal lucidity regarding the quality of education provided to every child especially in relation to the disabilities that a child may have.

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In South Africa, the development of the policy and legislative framework for Inclusive Education has been influenced by international conventions and declarations that accentuate the imperativeness of delivering equal educational opportunities for all learners, irrespective of their contextual circumstance or abilities. “The Bantu Education Act of 1953 was the legislative instrument which enforced a racial divide in South African education. Education for non-whites under the Act, was to prepare them for a realistic place in white dominated society” (Christie & Collins, 1982, p. 60). The journey towards inclusive education in South Africa began with the National Education Act of 1996, which intended to transmute the education system and address the inequities of the past, it sought to promote the right of all learners to education, and to ensure that education is provided in a manner that promotes the progress of the learner's behaviour, aptitude, and psychological and physical abilities to their fullest potential.

In 2001, White Paper 6 on Inclusive Education was initiated, which provided a policy framework for the transformation of the education approach to advance inclusive education (Department of Education, 2001). This was followed by the Revised National Curriculum Statement (RNCS) in 2001, which aimed to provide a curriculum that is applicable to the needs of all learners and promotes the values of a democratic society (Department of Education,2001.) In 2005, The Curriculum and Assessment Policy Statement (CAPS) was introduced, which aimed to provide a comprehensive curriculum that is inclusive of all learners, and promotes access, redress, equity, and quality in the provision of education. The School Infrastructure Norms and Standards (SIAS) were also developed in 2011, which aimed to provide guidelines for the provision of infrastructure in schools to guarantee that all students have access to innocuous and conducive learning environments (Department of Basic Education, 2011).

In relation to international conventions and declarations, the Education For All (EFA) conference in 1990 was a key milestone, which commended to giving quality essential education for all children, youth and adults (UNESCO, 1994). This was followed by the Salamanca Declaration in 1994, which called for the inclusion of all learners, including those with disabilities, in the mainstream education system (UNESCO, 1994).

The Dakar Framework for Action in 2000 reaffirmed the commitment to EFA and called for the development of comprehensive early childhood programs and free primary education and the elimination of gender disparities in education (UNESCO, 2000). The (MDGs) in 2000 also set objectives for succeeding in universal initial instruction and reducing educational inequalities based on gender by 2015.

The Convention on the Rights of Persons with Disabilities in 2006 was another significant milestone, which called for 'The right to education' for all persons with disabilities, and the promotion of inclusive education systems at all levels (Engelbrecht, Nel, Smit & van Deventer, 2015). The South African Schools Act of 1996 and White Paper 6 on Inclusive Education were key policy developments that aligned with these international conventions and declarations, by promoting the right of all learners to education and providing a policy framework for the revolution of the schooling system to promote inclusive education (Engelbrecht, Nel, Smit & van Deventer, 2015).

In 2011, the South African Schools Act was further strengthened with the introduction of the 'Screening, Identification, Assessment, and Support' (SIAS) policy, which aimed to provide support for students with social / and physical impairments (Engelbrecht, Nel, Smit & van Deventer, 2015). This was followed by the introduction of the Curriculum and Assessment Policy Statement (CAPS) in the same year, which aimed to provide a more streamlined and inclusive curriculum that is responsive to the needs of all learners (Engelbrecht, Nel, Smit & van Deventer, 2015).

Key international instruments that have shaped the approach to Inclusive Education in South Africa include the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), the Salamanca Statement, and the Education for All (EFA) initiatives. The UNCRPD, adopted in 2006, has been a driving force in promoting the rights of persons with disabilities, including the right to education. South Africa ratified this convention in 2007, committing to make certain that learners with impairments have access to inclusive education. In line with the principles of the UNCRPD, South Africa has developed inclusive education policies that aim to create a more unbiased and all-encompassing education system (Maseko, 2024).The constitution also underpins the South African Schools Act and National Education Act and the various curriculum options or changes that we've seen since 1994 moving from curriculum 2005 all the way up to what is currently in use the CAPS documents.

The Salamanca Statement, adopted during the World Conference on Special Needs Education in 1994, has also been influential in shaping South Africa's approach to inclusive education. The statement emphasizes the need for inclusive schools that accommodate all learners, regardless of their differences (UNESCO, 1994). In response to the Salamanca Statement, South Africa has implemented policies and programs aimed at promoting inclusive education and addressing hurdles to learning for all learners (UNESCO, 1994). Moreover, the EFA initiatives, launched in 1990, have underscored the importance of providing quality education for all students, including those with disabilities or special needs (UNESCO, 1994). South Africa's commitment to the EFA goals has led to the development of inclusive education policies that seek to improve access to education, reduce disparities, and promote inclusivity in the education system (UNESCO, 1994).

In terms of the local policy and legislative framework, South Africa has made substantial treads in promoting inclusive education through key legislation such as the South African Schools Act, the Employment Equity Act, and the White Paper 6 on Inclusive Education (Chirowamhangu, 2024). These legislative instruments outline the rights of students to have the ability to gain quality education, the responsibilities of schools and educators to provide inclusive learning environments, and the mechanisms for monitoring and evaluating inclusive education practices (Chirowamhangu, 2024).

There is an existing gap between policy (frameworks) and practice (reality) in South African schools to date. For example, Donohue & Bornman (2014) explore the challenges of implementing White Paper Six, focusing specifically on children with disabilities. They find that barriers exist at both the school and cultural levels, with many children still not attending school or being segregated in special schools due to negative societal attitudes and stigma. They argue for a top-down approach to address these barriers, emphasizing the need for clear and unambiguous policies. They believe that unclear policies can lead to inaction by stakeholders, as the lack of clarity can result in uncertainty and misunderstandings. They suggest that a clear policy is essential to ensure effective implementation and overcome the obstacles faced by students with impairments in education.

Furthermore, another example includes, Engelbrecht, Nel, Smit & van Deventer (2015) discusses the contests in achieving truly inclusive education in South Africa, noting discrepancies between policies and the reality in schools which may include children with ASD. While there has been progress in increasing school enrolments, inequities in class and

gender still exist, hindering full participation and quality education. Teachers continue to rely on a deficit approach to barriers to learning, emphasizing the need for support from the Department of Education in developing full-service schools. Research shows little change in attitudes towards inclusive education over a four-year period, highlighting the gap between policies and systemic realities. The article calls for clear directives, responsibility, and control to address these ongoing challenges.

South Africa's hypothetical transition from separate education systems for special and mainstream education to inclusive education through policy white paper six. However, challenges in implementation, such as infrastructure and teaching skills, create tensions and ambiguities, hindering the realization of inclusive education in mainstream schools (Maseko, 2024). White paper six established mainstream schools and full-service schools to cater to a wide range of learning needs, as well as special schools acting as resource centres. The goal was to provide adequate support for all learners, moving away from separate education for special needs and mainstream learners. However, many stakeholders viewed this as similar to the previous system(Maseko, 2024).

The social model of disability attributes exclusion to factors beyond disability itself, addressing marginalization through a comprehensive approach (Oliver, 1996). In contrast, the medical model segregates individuals who deviate from the norm, often relegating them to special schools (Terzi,2005). South Africa's history of systemic exclusion, essentially fuelled by racial tensions, necessitated post-1994 education policies to combat all forms of exclusion, including racism (Engelbrecht, Nel, Smit & van Deventer, 2015). The Education White Paper 6 (2001) largely aligns with the social model, yet retains elements of the medical model, highlighting the limitations of both frameworks in fully capturing the complexities of disability (Engelbrecht, Nel, Smit & van Deventer, 2015).

ABA is more commonly associated with the medical model of disability due to its focus on identifying and correcting perceived deficits in the individual. It is intervention-based, aiming to modify a person's behaviour or skills to meet societal standard (Leaf, Leaf, McEachin, J., Taubman, Ala'i-Rosales, Ross, Smith, & Weiss, 2016). While some may argue that there are ways to incorporate elements of the social model within ABA, the core principles and methods of ABA are grounded in the medical model of disability (Leaf, Leaf, McEachin, J., Taubman, Ala'i-Rosales, Ross, Smith, & Weiss, 2016). This distinction has been a point of debate, especially in discussions about the ethics and effectiveness of ABA, particularly when

considering its application to students with ASD and other developmental impairments (Leaf, Leaf, McEachin, Taubman, Ala'i-Rosales, Ross, Smith, & Weiss, 2016).

While ABA is rooted in the medical model, some critics argue that it could be adapted in a way that aligns more closely with the social model (Ryan, Thompson Guerin, Elmi, & Guerin, 2019). For example, some advocates suggest that ABA should focus more on creating inclusive environments that accommodate and support the individual's unique needs, rather than attempting to "normalize" behaviour. However, this kind of shift would require a fundamental modification in the nature and application of ABA and the underlying framework behind it (Ryan, Thompson Guerin, Elmi, & Guerin, 2019).

The model would be modified to fit resource-poor environments in South Africa, commonly being applied one-on-one or in small groups outside the regular classroom. The drill-like nature of ABA, reducing skills to their discrete parts, is seen as beneficial in assisting children who struggle with tasks social or cognitive in character. However, ABA dominance of autism intervention is inextricably bound up with a medical model of disability, pathologizing autism and seeking to 'normalize' behaviour (Milton, 2012). In the eyes of a critical researcher, this type of approach would be likely to stifle autistic identities rather than enable them. The social model, by contrast, requires inclusive practice that accounts for neurodevelopmental diversity and seeks environmental and pedagogic change rather than child change.

Among the criticisms that are especially pertinent in South Africa is the harvesting procedure of support through the withdrawal of children from regular classes for ABA sessions. This does not encourage inclusion, but instead advocates segregation, as opposed to inclusive pedagogical responsiveness that makes the learning environment conform to the learner's needs (Milton, 2012). There is an increasing body of literature calling for a turn towards neurodiversity-affirming practice that appreciates autistic modes of existing over attempts to fix them.

Addressing the third research question, although ABA might provide systematic and quantifiable methods that are worthwhile by some educators' accounts, its feasibility regarding large educational objectives has to be balanced. In contexts such as South Africa—where inclusion is both a national priority and an imperative—interventions, in addition to being evidence-informed, need to be ethically sound and culturally sensitive. The essentially critical preconditions for the practice's success, therefore, have to be collaborative working with

families, learner autonomy and respect for same, and incorporation into inclusive classroom practice.

There is growing recognition of the role of behavioural analysis in supporting inclusive education in South Africa. While statistical data on the exact application of ABA across mainstream schools is limited, there is evidence that it is used effectively in special schools and autism-specific programs. According to the Department of Basic Education (DBE), about 10% of South Africa's school-age children are residing with some form of impairment. Despite the theoretical alignment between ABA and South Africa's inclusive education policies, research by UNICEF indicates that 60% of students with impairments in South Africa do not have access to quality education, and many schools lack the infrastructure, resources, and trained personnel to implement evidence-based practices like ABA effectively (Chirowamhangu, 2024).

While the targets of Inclusive Education White Paper 6 and the recommendations of ABA advocates align in promoting better education for all learners, the practical realities in South Africa's educational system present substantial barriers. The larger class sizes and lack of resources stand in contrast to the individualized approaches that are often needed for truly inclusive education. Without addressing these systemic challenges, it will be difficult for South Africa to fully realize the vision of inclusive education that is central to the White Paper 6.

4.5 Experiences of students diagnosed with autism in South Africa

4.5.1 Pedagogical Inclusion and Teacher Support

Nthibeli, Griffiths, & Bekker, (2022) conducted a qualitative study in three Johannesburg schools that was purposed with exploring how teachers include learners with autism in mainstream classrooms. Educators employed strategies such as differentiation, scaffolding, visual cues, group activities, and collaboration to support autistic learners. The study emphasized that adequate teacher training and collaboration are essential for meaningful inclusion. Additionally, Education White Paper 6, adopted in 2001 aiming to transform South African schooling from a special-needs deficit model to one addressing "barriers to learning" across a continuum of provision (mainstream, full-service, special school resource centres). Despite this, implementation has not matched intent. Since 1994, progress has been slow; mainstream schools often lack infrastructure, resources, and trained personnel, and full-service schools remain limited in number. Additionally, implementation has fallen short, especially in mainstream schools due to limited teacher training, resource constraints, and weak translation of policy into practice. Students with autism are barely accommodated in mainstream schools,

not only because of the shortfalls that are embodied in the White Paper six but also because of the lack of knowledge and awareness in mainstream schools and communities in general.

4.5.2. Role of Learning Facilitators

In the Western Cape, learning facilitators and special support staff working alongside learners with autism were studied through interviews. Findings revealed issues such as unclear role definition, inconsistent training, and general feelings of being inadequately supported (Kempthorne, 2018). Facilitators who had better communication with role players and more structured training felt more effective (Kempthorne, 2018). Facilitators and educators alike underscored the importance of seeing each child as unique for successful inclusion (Kempthorne, 2018).

Similarly, Elliott (2021) in a study of private schools in the Western Cape explored educators' experiences working with in-class facilitators. The findings were overall positive but also highlighted the need for further development in mainstream classrooms, but again highlighted the critical need for formal training for facilitators to maximize their impact.

Futhermore, Elliott (2021, p71) asserts that in the western cape "Learning facilitators conceptualised their roles in various ways, mostly focussed on the needs of the child they were supporting. As such, learning facilitators explained that their role as facilitators was very much dependent on the specific child they were assisting." Moreover, the facilitators explained that children with ASD required much individual attention and support, especially in a mainstream school. Facilitators explained that their role as facilitators allowed them flexibility with respect to the way in which learning material is taught to the child in their care. (Elliott, 2021). They believed that mainstream learning approaches are inflexible and with their assistance, children with ASD benefitted as they enable the child to learn in a way that accommodates their needs (Elliott, 2021).

Many facilitators narrated instances of going above and beyond what was required as part of their role. Going above and beyond role requirements was a positive experience for one facilitator, who admitted that when her extra input went unnoticed, it became a less positive experience (Elliott, 2021).

4.5.3. Classroom Behaviours and Teaching ChallengesSumbane, Mothiba, Modula, Mutshatshi, & Manamela, (2023) assert that in the Limpopo province, using McKinsey's 7-S model, identified significant challenges faced by teachers of autistic learners, including

“Curriculum Misalignment”: Existing curricula don't cater to the unique needs of autistic learners, “Insufficient Teaching Materials”: Lack of resources, including teaching aids and health practitioners, affects education quality, “High Student-Teacher Ratios”: Unbalanced ratios lead to frustration and decreased effectiveness, “Inadequate Skills”: Teachers require specialized training to support autistic learners, “Unsupportive School Cultures”: Lack of management support and shared beliefs hinder teacher effectiveness. These systemic barriers hindered quality education for children with ASD (Sumbane, Mothiba, Modula, Mutshatshi, & Manamela, 2023).

In another context, amidst Johannesburg classrooms, Adams & Matsimela, (2023) contend that teachers were managing feeding difficulties for autistic children relied on strategies like modifying food texture to make it more manageable for autistic children, demonstrating appropriate eating behaviours to encourage children to mimic them, using positive reinforcement rewards or praise to encourage eating, and allowing children to choose what they want to eat from their lunchboxes. The study emphasized the need to address the individualised feeding needs of children with autism, specialized support and training to navigate such challenges effectively. Adams & Matsimela, (2023, pg.1) conclusively stated that “Implementing targeted interventions and providing resources for teachers could enhance their abilities to effectively support children with autism during mealtimes and promote a more inclusive classroom environment”.

In addition, occupational therapists working in schools reported high caseloads (e.g., one therapist per 300 learners), significant administrative burden from roles like writing SASSA grant reports, and limited parent engagement. These constraints compromised the overall support available to learners with autisim (Adams & Matsimela, 2023).

Additionally, curriculum adaptations in the South African mainstream schooling were often leading to unintentionally segregate learners. For instance, implementing separate functional curricula for children with developmental disabilities may reinforce divisions, rather than uphold inclusive ideals, especially when allocation criteria lack flexibility and are based on disability labels (Rinquest & Simba, 2024). It was argued that South Africa's inclusive education policies, such as the Education White Paper 6 and the Guidelines for Full-Service and Inclusive Schools, outline a compelling vision for inclusive education. However, the implementation of these policies faces challenges, including inadequate funding, insufficient teacher training, and a lack of infrastructure support. Rinquest & Simba, (2024, pg.79) contend

that "Our primary concern was the way the policies had understood and defined the challenges inherent to IE, which, in turn, set the tone for what could feasibly be achieved in terms of advancing social justice through IE. Even though there have been many studies on IE in South Africa".

Conclusively, the persistent policy–practice gap in implementing IE policies necessitates decisive action. As highlighted in the PPR, ongoing dialogue, evaluation, and capacity building are crucial for success. However, achieving true inclusion requires a broader understanding of social justice that moves beyond solely addressing cognitive barriers. To bridge this gap, we need a multifaceted approach.

4.5.4. Integration of ABA in The South African context

Among the key focuses of this research study was to investigate the lesser-known areas of the use of Applied Behaviour Analysis (ABA) in the context of South Africa. Far more, however, needs to be undertaken with regard to sharing insights regarding autism as well as pleading the cause of neurodiverse students through indigenous knowledge and Global South perceptions. For example, ABA's theory and applications, together with the majority of the evidence base, are based in the Global North, the United States, and Western Europe ((Keenan, Dillenburger , Röttgers, Moderato, & Rovetto,2015; Mudford, Taylor, & Martin, 2019). Dominance provides space to consider how the Global North's autism concepts are received or taken up in the context of the Global South. South African authors have advocated for a decolonized approach to autism and disability that is based on indigenous local community practice, culture, and language (McKenzie & Swartz, 2011). Placing ABA practices within indigenous South African knowledge systems might then be more culturally sensitive and sustainable support systems for neurodiverse learners (Grosser & Lombard, 2018).

4.5.5.Exploring ABA through Indigenous Knowledge and Global South Perspectives

ABA, created and studied primarily in the Global North, might not be entirely transferable to South African society. It is important to examine how such concepts exported become embedded or resisted on the ground so that they become culturally sensitive interventions. In South Africa, indigenous and cultural explanations, such as supernatural causation or ancestral retribution, typically frame how communities think about ASD, often for the purpose of deferring formal diagnosis and intervention access (Mofokeng, Matlakala, Tsabedze, Mapaling, & Erasmus, 2023).

Take for example, statistics points out that among certain South African communities, as many as 60% of individuals initially approach traditional healers for treatment, resulting in intervention delay (Mofokeng, Matlakala, Tsabedze, Mapaling, & Erasmus, 2023). Ethnographic studies place great emphasis on the inclusion of indigenous knowledge in strategies for the detection of autism. For instance, in South Africa and South Korea, research entailed the translation of measures as well as the engagement of stakeholders with culturally adapted strategies (Mofokeng, Matlakala, Tsabedze, Mapaling, & Erasmus, 2023).In Setswana-speaking caregivers, autism, or "bokoa jwa tlhaloganyo," is not known well, and myths or superstition are the reasons for misinformation and delayed diagnosis (Van der Merwe, 2020).

Van der Merwe (2020) further asserts that analysis of data showed that parents whose children were diagnosed with ASD were visited by family, friends or community members who were carrying indigenous Sepedi understandings of ASD cause and treatment. Perspectives regarding the student's umbilical cord being "flushed" and not buried as an etiology of ASD is a perspective that has not been found in literature (Van der Merwe, 2020). The Sepedi cultural belief that the student's name is an etiology of, and coping method with ASD, was also found during literature review that Taiwanese parents utilized to rename the child as a coping method (Van der Merwe, 2020). Results also suggested that community members advised that parents looked for pastors who felt that they had the ability to perform miracles and heal sicknesses. These non-Western understandings were confirmed namely that members of the community have the ability to heal other people, especially children, in the south African context. Some Sepedi community pupils expressed that the families or parents of students with autism didn't adhere, overlooked or abandoned traditional ways and accused parents of being too westernised and therefore the children ended up with ASD (Van der Merwe, 2020).

Van der Merwe (2020, pg.76) conclusively states that "This study found that there is a lack of indigenous terminology in the Sepedi language and the unawareness about ASD in the Sepedi culture. This lack of terminology further complicates endeavours to make people from a Sepedi culture, and probably other indigenous cultures too, more aware of ASD as the absence of known words makes explanations more difficult."

To add, Lentoor, Maepa, & Mdluli, (2022) further investigated the beliefs and knowledge and coping mechanisms used by black South African mothers in bringing up a child with autism. Nine mothers of children with autism spectrum disorder were purposively recruited through

snowball sampling in a qualitative cross-sectional study. The findings revealed that the mothers lack information on ASD (Lentoor, Maepa, & Mdluli, 2022). Most of the mothers blamed autism on God's will or spiritual witchcraft. Mothers used religion and spirituality to find outlets for coping with issues of having an autistic child. Spirituality is an important resilience source that deepens mothers' acceptance of children with autism (Lentoor, Maepa, & Mdluli, 2022). The network of other mothers was also discovered to be an additional coping strategy (Lentoor, Maepa, & Mdluli, 2022). Thus, parents overlook their psychological, physical and mental needs, there are significant economic emotional costs of caring for a child with autism spectrum disorder. The family also tends to fight over how to provide care to a child with ASD because they have no resources for meeting what they believe are the child's needs (Lentoor, Maepa, & Mdluli, 2022).

4.5.6. How teachers in various South African schools are developing pedagogical strategies to support children on the autism spectrum in inclusive classrooms.

This is very relevant in terms of the fact that most South African communities are usually not provided with access to specialist diagnosis and provision of support (Donohue & Bornman, 2014). Teachers who work in under-resourced environments are usually required to enact inclusive practices without training and support, so it is important to determine the adaptive practices they enact (Engelbrecht & Savolainen, 2018).

Furthermore, one must take into account the way autism is perceived in these societies and how this impacts education. Cultural perceptions of autism can impact help-seeking, stigma, and family involvement in education (Franz et al., 2018). Reading and syncretically integrating such literature into the argument made for Applied Behaviour Analysis (ABA) within the South African context would contribute to strengthening this study significantly by marrying it to both practical realities and sociocultural norms of the said communities.An investigation of South African teachers demonstrated to demonstrate the use of differentiation, scaffolding, visual aids, group work, and collaborative planning to assist students with ASD within inclusive classrooms (Nthibeli et al., 2022).Teachers were mostly adopting inclusive values, trusting in their ability to educate diverse learners and working together often to build student-responsive practice (Nthibeli et al., 2022). Even with the best of intentions, teachers articulated the primary problems—classroom overcrowding, minimal professional development, and inflexible curricula—barriers to inclusive pedagogy (Nthibeli et al., 2022).

In KwaZulu-Natal, very little awareness of ASD was articulated by communities and health practitioners as well. Parents explained that issues raised by children were frequently explained away or misunderstood, attributed wrongly as curses or punishment from God concepts which specifically limit access to schooling and early intervention (Pillai, Makhetha, & Aldous, 2021).

While policies like the White Paper 6 on Inclusive Education support the integration of learners with disabilities, they lack clear guidance on implementing specialized interventions like ABA. Public schools often lack trained ABA professionals, with implementation mostly occurring in privately funded or special education contexts (Pillay & Girdwood, 2020).

International guidelines recommend 20–40 hours/week of ABA therapy, but this is rarely feasible in South Africa due to cost, time, and human resource limitations. ABA effectiveness is strongly linked to parent training and follow-through at home—yet many families lack access, awareness, or time to be meaningfully involved (Gillespie-Lynch et al., 2014). Interventions need to be culturally appropriate, trauma-informed, and aligned with neurodiversity-affirming values—an area where many local ABA programs fall short (Melnyczuk, 2022).

In the researchers understanding, the silence of policy on ABA is telling, ,not because the method lacks merit, but because the system itself is not yet equipped to support complex, individualized interventions. This reveals a larger structural challenge: meaningful inclusion requires more than just space in a classroom; it demands funding, training, and policy clarity. Until these gaps are addressed, ABA may remain a privileged service rather than a public right.

4.6 Conclusion

In reflection of the juncture of Applied Behaviour Analysis (ABA) and inclusive education in South Africa, it becomes clear that the effective implementation of ABA can play a pivotal role in promoting positive outcomes for individuals with autism and other developmental disorders. The convergence of global research, local studies, and policy initiatives underscores the potential for ABA to support the development of more inclusive and supportive learning environments

CHAPTER 5: THE EFFECTIVENESS OF APPLIED BEHAVIOUR ANALYSIS (ABA)

5.1 Introduction

This chapter will explore the efficacy of ABA by discussing the effectiveness in relation to the 8 domains of functionality, targeting behaviour management within the model, assessments of maintenance of progress achieved as a result of the model, the role of qualified instructors/ practitioners in ensuring success and the long-term benefits of utilizing the model.

5.2 BASED ON ITS 8 DOMAINS OF FUNCTIONALITY.

The elementary aim of ABA for entrenched students is to teach societal, expansive, and daily subsistence abilities while encouraging desirable behaviours and lowering undesirable ones.

“This is achieved through positive reinforcement and creating learning environments that resemble natural settings, allowing children to generalize learned behaviours across different contexts” (Ziv, Hadad, & Khateeb, 2014, p.847). Applied behaviour Analysis (ABA) has been widely studied and implemented across various countries, demonstrating its effectiveness in enhancing multiple developmental domains, the 8 domains of functionality are namely “social, academic, motor, play, language, adaptive, cognitive and executive function domains” (The Star Academy, 2022).

Du, Guo, & Xu (2024, p.2)“Marshall through a review of research on communication and emotional skills, concluded that there is an increasing demand for the use of Applied Behavioral Analysis in the context of institutionalized children due to the rising prevalence of spectrum disorders worldwide, including in China”. To further support this, Du, Guo, & Xu, (2024) conducted a study that examined children aged 4 to 11, to evaluate the efficiency of Applied Behaviour Analysis based on its 8 domains of functionality. It investigated the impact of ABA on improving emotional and social skills in institutionalized students with ASD. The results indicated significant improvements in social, communicative, and daily life skills, highlighting ABA’s efficacy in enhancing emotional and social development within institutional care settings (Du, Guo, & Xu, 2024). The results of (Du, Guo, & Xu, 2024) align with the findings of Peters-Scheffer, Didden, Korzilius, & Sturmey, (2011) and Samson, Phillips Parker, Shah, Gross, & Harden, (2014) and Sneed, L. (n.d.) who all assert that ABA leads to efficaciously improved social and emotional skills after completing the sessions that are inclusive of “exercises were conducted to create calmness in children”, “Exercises involving the recognition of emotions and facial expressions aimed to familiarize children with facial expressions and express their emotional state, while complaint skills training focused on teaching the skill of objecting to pain”. (Du, Guo, & Xu, 2024, p.7).

Leif, Jennings, Furlonger, & Fox, (2020, p.2) assert that in Australia “over half of Australians diagnosed with ASD were not receiving the support they needed. These data are concerning, considering that there are over 200,000 Australians with a diagnosis of ASD, with an estimated 68.9% of them also having a severe or profound limitation in communication, self-care, or mobility. Given the 25% increase in prevalence of ASD in Australia since 2015….” In Australia, research evaluated the effectiveness of ABA-based intervention, on children aged 7–13 years with ASD. The findings demonstrated that applied behavioural analysis effectively improved emotional competence, suggesting ABA’s adaptability and success in enhancing

social and emotional development in diverse cultural contexts. (Leif, Jennings, Furlonger, & Fox, 2020)

Furthermore, in India, Ethiraj Rangaswami, & Sivamani, (2014) further suggest that ABA therapy can be an effective intervention for improving general development, language, and adaptive behaviour in children with autism. The article found significant improvements in the behavioural intervention group compared to the control group in "Symptom reduction: decreased severity of autism symptoms, specific behaviours: improved adaptive behaviour, language, and social skills, developmental areas: enhanced developmental levels, including cognitive and social development" (Ethiraj Rangaswami, & Sivamani, 2014)

Fong, Catagnus, Brodhead, Quigley, & Field, (2016, p,84) assert the importance of recognising different cultural perspectives in order to constructively evaluate the effectiveness of ABA by stating that "All individuals are a part of at least one culture. These cultural contingencies shape behaviour, behaviour that may or may not be acceptable or familiar to behaviour analysts from another culture. To better serve individuals, assessments and interventions should be selected with a consideration of cultural factors, including cultural preferences and norms." The authors further evaluate that ABA can effectively be implemented even in a cultural diverse state as South Africa, as they highlight the need for the instructors/ behavioural analysts to understand cultural difference and how these may impact the 8 domains of functionality. Furthermore, standard techniques and strategies may be adapted or modified to fit into the cultural norms and standards of the community at hand bearing in mind the culture, reflecting the values while also achieving the intended behavioural outcomes (Fong, Catagnus, Brodhead, Quigley, & Field, 2016),

Furthermore, in a diverse culture like South Africa, with 11 official languages, encompassing a wide range of cultural, ethnic and linguistic groups, understanding these differences is key to successfully implementing ABA. ABA interventions should and must go just beyond language adaptation, taking the historical and social context, for example, there are traditional practices that may label an autistic child as non other than autistic. In light of this, the aba intervention might be difficult to effectively deliver minus cultural sensitivity and adaptation (Fong, Catagnus, Brodhead, Quigley, & Field, 2016),

Tincani, Brodhead, & Dowdy, (2024) further examine how ABA can enhance autonomy and choice for students with Autism. The article explores how different strategies like "accessing and including individual preferences, teaching choice-making, utilizing argumentative and

alternative communication, supporting self control techniques" may all be tailored and included in a students individualized educational plan to promote autonomy and choice. Enhancing autonomy and choice may in turn heighten the quality of life and self-determination of autistic children (Tincani, Brodhead, & Dowdy, 2024).

Additionally, in the South African context a study was undertaken to observe and collet data on the lessons that took place utilizing the ABA model at a school, "The Star Academy" that specialises in only autistic children and utilizes individualized ABA plans (Govender, n.d.). The ABA model revealed to follow Vygotsky's model that states that education does not concur with development but is constructed to allow developing psychological functions that will be needed for the next educational step (Bodrova, 1997; Clarà, 2017). The findings indicated that the ABA model targets the acquisition of skills across all eight domains of functioning, however, it revealed that much prominence was given to the language and social domains of functioning. In addition to this, lessons were conducted with the objectives of allowing a child to construct on pre-existing skills when emerging new skills to acquire optimal functioning.

Lastly, Vygotsky maintains that humans remains "slaves to the environment" contingent upon only possessing lower mental functions and being utterly dependent on the incentive that derives from the exterior environment (Bodrova, 1997, p. 16 – 22). Furthermore, Govender (n.d, p.51) further supports Vygotsky by stating that, "Additionally, the data revealed that within each domain of functioning, lessons and the newly acquired skills are dependent on the skillsets acquired by the child within other domains of functioning such as the social and, likewise, the language domains. This further reinforces the notion that achievement of a skillset due to the ABA model is further dependent on external factors and functioning within additional domains". The study further revealed a concerning gap in the support provided to children with autism in their early learning years(Govender, n.d). While the study found that the Language and Social domains of functioning received preference, the Cognitive and Adaptive domains received limited emphasis(Govender, n.d). This oversight suggests that the ABA model may have limitations in its effectiveness in treating autism in learners, particularly in addressing their cognitive and adaptive needs (Govender, n.d).

5.3. Effectiveness of Targeting of Behaviour Management within the ABA Model

Autism has been shown to indicate regular behaviours such as Aggression, non-compliance, Tantrum Behaviours, and Vocal Protestation in addition to Echolalia that are frequently targeted in the ABA model. Chuang, (2021) notes that the resolution to the student's control of their behaviour lies in controlling the technique of stimuli, which is an approach of stimuli where social forces are presented outwardly to the child. Combined with the data collected, the above is consistent with the fact that "external regulators, task modification, environmental manipulation demand, fading in addition to SD modification" are utilised as efficacious behavioural interventions. Additionally, Lovaas (1987) further states that fading and prompting, when combined with other strategies like positive reinforcement, is very effective. ABA encourages the development of functional behaviours in a socially appropriate manner by encouraging positive or desired behaviour rather than punishing negative behaviour. "The rewards, praises, and encouragements that follow a behaviour are like props or buttresses that strengthen each point of advance through the ZPD, preventing loss of ground (DeVries, 2000; Chuang, 2021). This evident in the data collected which indicated that behaviour management techniques whereby techniques such as functional communication training and environmental modification which were instrumental in the decreasing of problematic behaviour." (Govender, n.d, p.57)

In addition to the above, generalization of skills in ABA has proven to be an additional success. It ensures all the skills or desired behaviours developed/ learned during the intervention may be applied in various settings, contexts and individuals either than the place of learning (Stokes, & Osnes 1989). Swan & Carper, (2015) reinforces the idea that generalization is key for long-term success in individuals with ASD who may struggle to transfer learned behaviours from one context to another, Without generalization skill that may be acquired in a structured environment will not be applicable in a non-structured environment. Take for example, Lebo is a 7 year old autistic girl who struggles to ask for help when frustrated, she would rather scream and throw a tantrum. The instructor will work on teaching her the phrase, "May you please help me" when frustrated rather than screaming and throwing a tantrum- Functional Communication training. The instructor will further communicate with the parents to prompt her in using the phrase; when she does, the behaviour is reinforced by a praise or a favourite snack. Furthermore, the instructor will prompt and reinforce the behaviour in a school setting- if the instructor sees Lebo struggling with a math problem, the instructor will encourage her to ask for help in the same way she did during therapy. In brief, lebo would have generalized the

ability to ask for help in various settings thus ensuring long term success and effectiveness in fostering her independence and social integration (Swan & Carper, 2015). However, due to the characteristic of autism that can affect the ability to transfer skills across as it may cognitively affect how children process and respond to their surroundings. Stokes, & Osnes (1989) emphasize teaching behaviours in multiple settings, with various people and in diverse conditions to ensure generalization and maintenance of the skill.

5.4 Effectiveness of Assessment of the Maintenance of Progress Achieved as a result of the ABA

The maintenance of the progress achieved through ABA interventions is to be considered as a critical aspect of the effectiveness of the intervention. "According to Vygotsky, organised learning can result in the development of various mental processes and functioning (John-Steiner & Mahn, 1996; Illeris, 2018)." (Govender, n.d). By engaging in a structured procedure of progress analysis, the child can maintain proficiency of the newly developed skills as cognitive development is a reflective, constant, and infinite process (Devi, 2019). Furthermore, Baer, Wolf, & Risley (1968) highlights the critical importance of ensuring that interventions for autistic children prioritize long-term behaviour change. In other words, it's not enough to just teach a new skill or behaviour -the objective is to ensure that it is taught and there is maintenance technique in place for it to be effective. Practitioners/ instructors must plan for ongoing maintenance and support throughout the intervention to guarantee lasting impact.

Lebo who has trouble sharing toys with peers. An effective intervention would not only teach Alex how to share, but also provide strategies for Alex's caregivers and parents to reinforce and maintain this behaviour over time. This might include creating visual reminders, providing positive reinforcement, and gradually phasing out supports as Lebo becomes more confident in sharing by prioritizing sustainability and maintenance.

Conclusively, Hagopian, Fisher , Sullivan, Acquisto, & LeBlanc (1998) place prominence in strategically using reinforcement schedules and natural consequences reinforcing long tern behaviour maintenance. The essential idea is that the less a behaviour relies on external reinforcement, the more likely it is to become sustainable and empowering students to take responsibility for their behaviour (Hagopian et al., 1998).

5.5 The role of qualified ABA practitioners instructors in ensuring the effectiveness of ABA

“The first efforts to develop a system that identified behaviour-analytic practitioners having a specified level of expertise in the profession began in the early 1970s. Over the years, a number of credentialing initiatives were developed in an effort to meet the profession’s growing needs for a means of establishing a meaningful professional identity” (Johnston, Carr, & Mellichamp, 2017, p. 523). The effectiveness of ABA is largely dependent on the qualifications and skills of the practitioners who implement it to ensure correct Implementation of Techniques, cultural adaptation, consistent and reliable individualized plans and ethical decisions driven by data statical evidence. Worldwide, the becoming a qualified ABA practitioner or instructor includes “a Master’s degree in behaviour Analysis, Psychology, Education, or a related field. Completion of coursework covering the core areas of ABA, such as behaviour principles, ethical guidelines, and assessment techniques. A set number of supervised hours (usually around 1,500 to 2,000 hours) is required to ensure practical experience. After meeting educational and experience requirements, candidates typically take the Board Certified Behaviour Analyst (BCBA) exam, which assesses knowledge of ABA principles, practices, and ethics. To maintain certification, practitioners must engage in continuing education and demonstrate ongoing professional development” (Johnston, Carr, & Mellichamp, 2017, p. 524-528). Additionally, Kelly & Tincani (2013) surveyed 302 behavioural professionals, 95% of whom worked with individuals with ASD, the outcomes highlighted the need for more comprehensive training programs that prioritize collaboration and interdisciplinary teamwork for practitioners.

The rising numbers of autism and recognition of Aba as an effective intervention in South Africa further make it a necessity for qualified practitioners. The process is not standardized in South Africa as though in the northern hemisphere. The star academy, (2022) stipulates the process as follows, “You will then be required to attend a Zoom presentation which will give you detailed information about the job opportunity. At the end of the Zoom presentation you will be given the opportunity for a one minute interview. Once you have passed your interview we will send you the material necessary for you to study towards a theory exam. Once you have prepared for the theory exam you will be required to write an online exam and achieve a passing mark of 80 percent. Should you achieve 70%, you will be given the opportunity for a rewrite. Thereafter you will be invited to attend practical training for two weeks. You will also be required to submit an open book assignment on ‘Saving my Sons: A Journey with Autism’ by Ilana Gerschlowitz. Should you pass your field exam, your open book exam and your theory exam, you will be presented with an employment opportunity. The Star Academy’s BCBA’s

will provide you with continued supervision and training which will enhance your skills to deliver top quality ABA programs. Please note that at the end of your ABA training Star Academy will not be able to provide you with a formal certificate in ABA". While local options may be limited, online programs from internationally recognized institutions may be pursued. while there isn't a single unified certification process, pursuing international certification like BCBA is an effective route to becoming a qualified ABA practitioner (Johnston, Carr, & Mellichamp, 2017).

5.6 Long-Term Effects of ABA

Eldevik et al., (2009) in a meta-analysis viewed ABA as the 'gold standard' intervention for treating ASD. To support this Vismara & Rogers, (2010, p.448) elaborate that "ABA-based interventions have been found to positively impact lifelong development, with notable improvements in intellectual functioning, language development, acquisition of daily living skills, and social functioning."

Sambandam, Warle, and Rangaswami (2020) investigated the long-term effects of Applied behaviour Analysis (ABA) interventions on social interaction and societal development in students with autism. The research comprised of 60 children aged 3 to 10 years, diagnosed with autism, who were randomly assigned to either an tentative cluster (30 children) receiving ABA-based interventions or a control group (30 children) receiving conventional interventions. The ABA intervention focused on enhancing social skills, communication abilities, and social maturity over a one-year period. The findings indicated that the experimental group (ABA) showed significant improvements in symptom decline, social skills, communication, and societal maturity in contrast to the control group. The outcome demonstrated medium to large impacts on the lifelong advancement of students with ASD. "Regardless of the breadth and depth of the scientific research supporting the effectiveness of ABA, there are misconceptions that exist against the field. Generally speaking, criticism of a field is welcomed—valid criticisms help a field self- evaluate and, perhaps, correct itself toward establishing optimal, high-quality services" (Sambandam, Warle, and Rangaswami, 2020, p.7)

In contrast, (Sandoval-Norton & Shkedy, 2019, p.2) assert that "While operant conditioning may be effective for teaching specific tasks in certain situations, in nearly all other circumstances, it is not typically used to the extreme extent that it has been applied with for the treatment of many children with ASD. Take toilet training for example; many typical children and children with ASD are toilet trained using operant conditioning. However, this conditioning

only applies to the one skill—and once they have mastered it, the conditioning subsides." Additionally, Sandoval-Norton & Shkedy (2019) argue that ABA which relies on external reinforcement may lead to disproportionate compliance that disregards the student's autonomy and may constitute "abusive practices". Furthermore, they go on to delve into how such interventions often seem to suppress natural behaviours and enforce external measures without considering the student. The criticisms of ABA included that "ABA is unethical and abusive, it promotes prompt dependency, it only works for children with particular characteristics of ASD, includes methodologies that are considered "out of date" and ineffective, it has no data showing its effectiveness over the long-term." (Sandoval-Norton & Shkedy, 2019, p. 2-6) Conclusively, the authors call for a readjustment of ABA practices as they may be considered abusive.

In response to this article, Gorycki, Ruppel, & Zane, (2020) address the concerns brought forward by , (Sandoval-Norton & Shkedy, 2019), stating that ABA when implemented ethically with individualized educational plans that consider each student's individuality has positive long lasting impacts that include improved high Academic operative, proficient Language development, inherent procurement of instrumental independent day to day living skills, improved and high social functioning skills. They further elaborate by responding to an example used by the authors, "It is against the Behavior Analyst Certification Board's *Professional and Ethical Compliance Code for Behavior Analysts* to continue treatment for an extended period of time if that skill is not being mastered. Behavior analysts strive to teach individuals skills that will promote the most independence possible, and toilet training fits within this definition." (Gorycki, Ruppel, & Zane, 2020, p.3).

While it is imperative to note that ABA is not a cure but an intervention for ASD that has positive long lasting effects. The question that often arises is how long it takes to see the effectiveness of ABA. This is all dependent on a variety of factors including, the individuals age, level of functioning, specific needs, how early the intervention is, how often- how many hours a week the intervention is practiced, the environmental, and cultural factors (community, family, practitioners) that may influence the child's ability.

5.7 Conclusion:

In conclusion, this chapter has provided a comprehensive examination of the efficacy of (ABA) in promoting meaningful outcomes across various domains of functionality. By exploring the model's impact on behaviour management, maintenance of progress, and the

crucial role of qualified instructors, we have gained a deeper understanding of ABA's potential to drive lasting benefits for students with autism.

CHAPTER 6: CONCLUSION

6.1 Introduction

This chapter will explore the summary of study including a conclusive summary of how the research has answered the research questions, conclusion and implications of study, limitations of the study and future recommendations.

6.2Summaryand Importance of Study:

Despite the growing recognition of (ABA) as an effective intervention for autism, there is a notable gap in research examining its suitability and efficacy within the South African context. This study sought to address this knowledge deficit by investigating the application and effectiveness of ABA interventions for learners with autism in South Africa. This study commenced with an examination of the complex and multifaceted nature of autism. Subsequently, it investigated Applied behaviour Analysis (ABA) as an intervention approach for autism, with a specific focus on its potential effectiveness within a South African context. To achieve this objective, the study undertook a comprehensive review of existing research on ABA, both internationally and locally. This involved analysing global and local studies that have examined the effectiveness of ABA in various settings, with the aim of determining its potential applicability and efficacy in South Africa.

Finally, I explored how the success of ABA interventions was measured, wanting to know if the progress made through ABA was lasting. Our findings showed that for a new skill to be considered truly learned, individuals had to be able to use it independently for at least a year after mastering it.

Importance of the study

This research is of great relevance in that it critically analyses Applied Behavioural Analysis (ABA)—an internationally accepted, evidence-based treatment protocol for Autism Spectrum Disorder (ASD)—in the distinctively multifaceted South African schooling and socio-economic environment. Though extensively studied and utilized in first-world nations, ABA usage in the South African setting is patchy, under-explored, and predominantly reserved for exclusive therapeutic environments. As autism diagnoses have been increasing and there is an evident need for structured, evidence-based interventions, this study attempts to offer a thorough discussion of the theoretical underpinnings of ABA with direct linkage to the reality of South African school practice.

Inspired by three specific research questions, the research explores: (1) the ABA theoretical framework and its implications on treatment strategies in South African settings, (2) the manner in which the ABA model addresses areas of functioning in autism learners, and (3) what factors contribute to its successful application within schools. In doing this, the research emphasizes the significance of teacher knowledge, availability of resources, training, and policy congruence in ensuring ABA is not only theoretically valid but also practically applicable. In addition, through the comparison of public and private school settings, the research considers urgently needed equity issues, calling for broader access to ABA-informed support for all students, regardless of socio-economic background.

Most notably, this research fills an enormous gap in the scholarship in Sub-Saharan Africa, where interventions for autism are frequently applied inconsistently and culturally out of sync. It lays groundwork for subsequent research and yields actionable results for educators, school administrators, policymakers, and allied professionals striving toward inclusive education and successful autism support. In a nation in which early intervention can significantly enhance long-term outcomes, this research is both timely and needed.

6.3Summary of findings in relation to the research questions

6.3.1What is the theoretical framework of Applied Behaviour Analysis (ABA), and how does it inform treatment approaches for children with Autism in South Africa?

The study was effective to ascertain that ABA is grounded in the operant conditioning theory of behaviourism, i.e., observed behaviour and environmental factors. The ABA theory supports individualized, data-driven interventions for the modification of socially significant behaviour among children with autism. For the South African scenario, the principles were adaptive even in the absence of resources, particularly if culturally modified adaptations are made (Cooper, Heron, & Heward, 2020). This initial comprehension is an indication of how ABA's theoretical foundation continues to inform the development and application of autism intervention globally, and locally. The study confirmed that behaviourist theory, specifically operant conditioning, forms the theoretical basis of ABA and addresses the use of reinforcement to alter socially significant behavior. In South Africa, ABA offers a linear, evidence-based model that is applicable in various cultural and socio-economic contexts. This study discovered that despite limited access to resources, ABA's emphasis on observable behavior, quantifiable

outcomes, and individualized treatments makes it an efficient and scalable model within South African schools (Cooper, Heron, & Heward, 2020).

While a strong international body of research is available on Applied Behaviour Analysis (ABA) as an evidence-based intervention for Autism Spectrum Disorder (ASD), the South African context is devoid of theory and contextual research distinct from the South African setting. The majority of research and training on ABA is from Western settings, with little, if any, cultural, language, and system adaptation to South African conditions. Literature does not frequently consider how the general theories of ABA—operant conditioning, reinforcement schedules, and task analysis—apply in the South African classroom, which frequently is overcrowded, under resourced, and staffed by teachers with limited special education training. This lack of locally based investigation allows for a theory-practice disconnect that challenges the applicability and appropriateness of implementing general ABA procedures across homogeneous South African schools.6.3.2How does the Applied Behaviour Analysis model specifically address each functioning domain for learners with Autism in the South African context?

The research was effective to confirm that ABA is based on operant conditioning theory of behaviourism, i.e., observable behaviour and setting. The ABA theory lends support to individualized, data-based treatments for the change in socially significant behaviour in children with autism. Within the South African context, the principles were flexible even in the absence of resources, especially if culturally modified alternatives are utilized (Cooper, Heron, & Heward, 2020). This initial knowledge is an appreciation of the way that the theory foundation of ABA continues to guide the development and implementation of autism intervention worldwide, and in our own backyard. Research had established that operant conditioning is the behaviourist theory which constitutes the theoretical foundations of ABA and deals with the use of reinforcement in order to alter socially significant behaviour. In South Africa, ABA provides a linear evidence-based approach that is workable across different culture and socio-economic levels. This research established that in spite of the limitations in resources, ABA's focus on observable behaviour, measurable results, and individualized treatments makes it a replicable and effective system in South African schools (Cooper, Heron, & Heward, 2020).

The research showed how ABA interventions may be customized to assist learners in all eight domains of functioning:

- Cognitive functioning – ABA encourages attention, problem-solving, and academic preparedness through systematic learning sessions and reinforcement.
- Language and communication – Techniques like Verbal Behaviour Therapy and PECS (Picture Exchange Communication System) enable the development of expressive and receptive language.
- Interpersonal and social functioning – Social skills training under ABA assists students in initiating and sustaining interactions.
- Emotional functioning – Identification, expression, and regulation of emotions are addressed in interventions.
- Sensory processing – ABA accommodates sensory sensitivity through desensitization and environmental modifications.
- Motor functioning – ABA employs chaining and reinforcement to learn fine and gross motor activities.
- Adaptive behaviour – Self-care and daily living skills are acquired through task analysis and procedural routines.
- Behaviour regulation – Functional Behaviour Assessments (FBAs) and behaviour intervention plans govern self-regulation and problem behaviour reduction.

The results support the fact, where contextually modified, ABA provides an inclusive model to assist autistic students with these domains in inclusive South African classrooms (Vorster & Van der Merwe, 2021).

The research established and outlined that the theoretical basis for ABA comes from behaviourist theory, specifically operant conditioning, with a concentration on reinforcement in the construction of acceptable behaviour. In the South African context, ABA offers a systematic, evidence-based approach that can be applied in various cultural and socio-economic contexts. From this study, it was discovered that with restrictions on access to resources, ABA's emphasis on measurable outcomes, observable behaviour, and individualized interventions makes it a scalable as well as effective model in South African schools (Cooper, Heron, & Heward, 2020).

Another key literature deficiency is the limited data about how precisely ABA targets each of the developmental and functional areas—communication, social interaction, behaviour regulation, and academics—of South African students with autism. While global research across the board cites ABA's success at cultivating outcomes in these domains, few domestic

studies have assessed how these outcomes are achieved in South African schools, particularly the foundation phase. The empirical evidence is notably weaker for functional strategies like Discrete Trial Training (DTT), Natural Environment Teaching, and Positive Behaviour Support since they are used (or not) in classrooms here. The lack of domain-specific research limits teachers, therapists, and policy makers from making better-informed decisions regarding intervention design and priority when faced with contexts of resource shortages.

6.3.3 What are the key factors that contribute to the effective application of the ABA model for learners with autism in South African schools?

Research identified a number of issues crucial to the successful operation of ABA throughout South African schools. These were training for educators, exposure to ABA-certified practitioners, culturally adapted forms of standard procedure, and community engagement. Additionally, availability of resources, family collaboration, and support at a policy level within the system were seen as critical to long-term sustainable operation. Research revealed that where teacher provision of targeted ABA training and professional support was provided on a continuous basis, implementation was feasible and more efficient (Arick, Nave, Hoffman, & Krug, 2017).

Some key factors were revealed in the research that enable effective ABA implementation in South African schools. They include access to trained ABA professionals or paraprofessionals, building teacher capacity, access to resources, practice that is culturally responsive, and family participation. Additionally, collaboration of stakeholders within the school and in the community and incorporation with inclusive education policies was found to strengthen sustainability and continuity of intervention implementation. Under the presence of these conditions, ABA is most likely to produce desired outcomes in all dimensions of development (Arick, Nave, Hoffman, & Krug, 2017).

The researcher identified the most substantial gap that was made apparent in the literature is that the determinants of the implementation of ABA in South African schools have no empirical research associated with them. Research infrequently assesses the impact of teachers' knowledge, attitudes, and level of training on the take-up of ABA, or adequately considers how variability between public and private schooling environments has an effect on access and quality of interventions. In addition, insufficient studies on the structural and systemic constraints—i.e., too few training programs, suboptimal budgets, and policy support—hindering ABA integration into general inclusive education systems are lacking. Without it,

scale-up efforts of ABA interventions are unlikely to be properly contextualized against local contexts and thereby will restrict their impact on the most vulnerable learners.

6.4 Conclusion and Implications of Study

This study demonstrates the evidence driven benefits of (ABA) as an intervention for treating autism for students in South Africa. While ABA successfully targeted various functional areas across different domains, the findings highlight the importance of balancing development across all domains to ensure children acquire a comprehensive range of skills, ultimately promoting more holistic growth.

6.5 Limitations of the Study

"The degree to which the research findings are consistent with reality is referred to as credibility" (Silverman, 2010; Mohajan, 2017, p.10).

6.6.1 The challenges/limitations in the use of ABA model for students with autism in South Africa.

The use of the Applied Behaviour Analysis (ABA) model for students with ASD in South Africa faces several challenges and limitations. One major challenge is the lack of trained professionals and resources to implement ABA interventions effectively. South Africa, like many other developing countries, has a limited number of Board-Certified Behaviour Analysts (BCBAs) or trained therapists who can provide ABA therapy to students with ASD (Singh et al., 2019). Another challenge is the lack of awareness and acceptance of ABA therapy among parents, educators, and healthcare professionals in South Africa. Some cultural beliefs and misconceptions about autism may also hinder the implementation of ABA interventions in this population (Singh et al., 2019).

Some limitations may include ABA therapy aims to change behaviour to be more socially acceptable and functional, which can sometimes lead to a focus on compliance and conformity rather than promoting individuality and self-expression. Additionally, some critics argue that skills learned in ABA therapy may not always generalize to real-world settings or contexts outside of the therapy environment, which can limit the efficacy of the intervention. In addition, the cost of ABA therapy and restricted insurance coverage for autism treatment in South Africa can make it difficult for families to access and afford these services. This financial barrier further exacerbates the disparities in access to ABA therapy for students with ASD in the country (Ramdhani et al., 2018).

Some challengers of ABA therapy raise concerns about the use of aversive techniques, such as punishment or negative reinforcement, which can be harmful and may not align with ethical guidelines for treating individuals with developmental disabilities (Singh et al., 2019 &Ramdhani et al., 2018). This research study additionally concluded that although an array of areas of functionality were targeted within each domain of functioning, further emphasis should be attributed to the equal development of all domains of functioning, therefore, allowing for the child to acquire a complete repertoire of skills.

Overall, while ABA therapy has been shown to be effective for many students with autism and other developmental disabilities, it is important to consider these potential disadvantages and seek out alternative or complementary interventions that may be merged with ABA that may better meet the needs of the particular student.

6.7 Future recommendations

The development of early childhood self-regulation is often considered an early life marker for later life successes (Montroy et al., 2016). Vygotsky argues that when people rely solely on basic mental functions, they become "slaves to the environment," completely dependent on external stimuli (Bodrova, 1997, p. 16-22; Toomela, 2016). Accurate statistics on the prevalence of Autism Spectrum Disorder (ASD) in South Africa are crucial to understanding the true incidence of the disorder in the country. To gain a clearer picture, it would be beneficial to collect data on the number of individuals diagnosed with ASD in each province, tracked on a yearly basis. This data collection should also consider the economic status of the parents, as socioeconomic factors can influence access to resources, healthcare, and early intervention programs. Given that Applied Behaviour Analysis (ABA) is a highly individualized approach to therapy, all students diagnosed with autism could potentially benefit from being recommended to the program. However, each child would need a personalized plan, tailored to their unique needs and challenges. This individualized approach ensures that the interventions are effective, targeted, and appropriate for the specific developmental goals of each child. By integrating ABA into the educational system with individualized plans, children with autism could receive the support necessary to help them thrive in both academic and social environments.

Given that ABA remains one of the most empirically supported interventions for autism, its successful implementation in South African schools hinges not only on system-level resources, but on teachers' conceptual and practical understanding of both ASD and ABA principles.

Currently, there is a lack of research examining South African teachers' specific knowledge and perceptions of ABA, as well as how their training influences their willingness and ability to implement it in classroom settings. This is particularly urgent in the context of South Africa's under-resourced and policy-fragmented education system, where early identification and intervention can make a profound difference in long-term outcomes for autistic learners. Therefore, a focused research study exploring South African teachers' knowledge and understanding of both ASD and ABA is not only timely—it is essential. Such research would offer valuable insight into existing training gaps, inform future professional development frameworks, and contribute directly to improving inclusive education practices across the country.

Furthermore, the study suggests that South Africa should develop policies that support ABA that are both culturally sensitive and economically practical, ensuring they are relevant and effective within the country's unique context. it's recommended that children be guided to understand the cause and effect of their behaviour, in addition to using behaviour management strategies. This approach will help them learn to self-regulate, preventing disruptive behaviours before they occur. It's also important that these newly learned skills are practiced and maintained regularly in real-life situations. This will support the assessment, generalization, and improvement of these skills across different environments and with different people. Collectively, proportional assessments should be conducted where data should be collected from numerous settings where ABA is the primary intervention method.

In addition, there is a pressing need for comparative studies of ABA knowledge and application among private versus public schools in South Africa. Practitioner and anecdotal reports are that ABA services are more likely to take place in private schools or specialist centres, available only to families who can afford to pay for intensive, expensive services. By contrast, students with autism in the public schools—those within rural or less affluent schools—are less likely to be offered individualized behavioural treatment or systematic support. This discrepancy reflects deeply embedded differences in service provision and must be tested empirically. This requires investigation to examine if private schools would be more likely to use formal ABA approaches (e.g., Discrete Trial Training, functional behaviour analysis, or systems of reinforcement), while public schools depend on more generalized or reactive behavioural policy, training, and capacity-limited strategies.

Carrying out such a study not only would determine existing ABA practice mapping in schools, but also would shed significant light on the extent to which teacher competence, school resources, and access to training impact the quality and homogeneity of autism interventions. Such research ultimately would inform follow-up professional development plans, education policy updates, and advocacy efforts to obtain fair, evidence-based services for all autistic students regardless of socioeconomic background or school setting.

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