EFFECTIVENESS OF PICTURE EXCHANGE STRATEGY ON THE

COMMUNICATION SKILLS DEVELOPMENT IN AUTISTIC CHILDREN

: A case study of Bauleni Home Based Education Programme, in Lusaka, Zambia

Submitted by Mikala Mbewe

A dissertation submitted to the University of Zambia in partial fulfilment of the requirement for the award of the Master of Education in Special Education

UNIVERSITY OF ZAMBIA

LUSAKA

2016

DECLARATION

I, Mikala Mbewe, hereby declare that the work contained in this dissertation is typically as a result of my own individual effort and that all the work from other researchers has been acknowledged. I further certify that this dissertation has not been submitted for a degree in any University or similar institutions.

Signed: .....

Date: .....

DEDICATION

To my family, my late brothers, sisters, dady and mum whom I dearly loved.

APPROVAL

The University of Zambia approves this dissertation of Mikala Mbewe as fulfilling part of the requirements for the award of the degree of Master of Education in Special Education.

Signed:.....Date:.....

Signed:.....Date:.....

Signed:.....Date:.....

ACKNOWLEDGEMENTS

I wish to acknowledge all the parents, teachers and pupils who took part in this study, knowing that it was not an easy decision to make as they allowed themselves to take part in a study that was happening in their lives for the first time. My gratitude also goes to Dr Matafwali for her guidance.

Table of Contents

LIST OF TABLES

LIST OF GRAPHS

LIST OF ABREVIATION

AAC - Augmentatives Alternative communication

ABA - Applied behaviour analysis

ABC – Antecedent Behaviour Consequence

ASD - Autistic Spectrum Disorders

B. F. – Burrhus Frederick

HSB – Home Based Education Programme

PES- Picture Exchange Strategy

ABSTRACT

This study aimed at investigating the effects of picture exchange strategy on the communication skills of autistic children. It attempted to explore whether the picture exchange strategy could be used in Zambia in order to help children with autism to communicate. The study drew mainly on the children's actual behaviour as they were exposed to the strategy during base line, intervention and post intervention periods. The study also incorporated the perspectives of parents and volunteer teachers who were involved during the study. To date, it is evident that there has been no research that has identified better methods of teaching communication to learners with autism in Zambia. It is against this background that the present study attempted to determine the effectiveness of Picture Exchange System (PES) in enhancing communication skills in children with autism. A case study research design was conducted to determine the effectiveness of teaching Zambian children with autism to communicate their needs using PES. Single subject case design with four children by using the antecedent, background and consequence strategy was used along with focus group discussion for teachers, parents/caregivers conducted in Bauleni Compound of Lusaka, Zambia. The number of discrete trials it took for each child to obtain and use the skill consistently varied with most effectively learning it within 70 trials. The pace for the PES acquisition skill largely depends on caregiver support, attachment and commitment rather than child age and the mere presence of a care giver. It is evident that all children were able to acquire the communicative skill. Implementing PES training is critical in Zambia. The study recommended that the Teacher Training Colleges and Institutions should include Augmentative and Alternative communication in the Teacher training curriculum and Universities. Besides that, the government should encourage line Ministries to collaborate in conducting early identification and intervention strategies for children with autism to improve the acquisition of effective communication at a younger age. In addition, parents should collaborate with teachers in order to come up with intervention programmes that receive positive reinforcements in all environments. They should also receive various training in disabilities.

In conclusion, the study suggests that the picture exchange strategy is effective in helping children with autism initiate communication. Additionally, as children use the strategy some may also learn verbal language and reduce unwanted behaviours.

CHAPTER ONE
INTRODUCTION

1.0 Overview

This chapter presents the background of the study, statement of the problem, purpose of the study, objectives and research questions. Furthermore, the chapter highlights the significance of the study, limitations of the study and operational definition of terms.

1.1 Background

The diagnosis and implementation of appropriate intervention strategies for children with intellectual disability in Zambia is complicated by several factors and is worse for children with autism because there is no policy direction regarding the appropriate pathways of such children from any of the Education policies as supported by Munsaka and Matafwali (2013). One of the largest complications is that there are a very small number of trained professionals' apart from special education teachers' interested in and competent to work with such children. Those professionals that do exist are concentrated in big towns where educational programmesfor such children exist.This leavesmost of the rural areas with no intervention programmes or competent and motivated professionals to provide education to support children with autism. One important step to obtaining appropriate education for professionals and sufficient teaching programmes for children with autism is to identify the need for such programmes based on the identification of the number of children in Zambia with autism. Currently there are no appropriate strategies in Zambia for identifying and teaching children with autism communication skills such as the picture exchange strategy,yet the American Centre for Disease and Control and Prevention (2010) estimates that 1% of the world population are people with autism.

1.1.1 The onset of Autism

Autism is a complex developmental disability that appears during the first two years of the child's life and is the result of a neurological disorder that affects the functioning of the brain. This disorder impacts development in the areas of social interaction, imagination and communication skills. According to the Diagnostic and Statistical Manual of Mental Disorders -5 Diagnostic criteria for Autistic Spectrum Disorder (2013: 12) a child has the condition when he/she has:

A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive, see text below):

1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.

2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.

3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypes, lining up toys or flipping objects, echolalia, idiosyncratic phrases).

2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day).

3. Highly restricted, fixated interests that are abnormal in intensity or focus such as strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest.

4. Hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment such as apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement.

C. Symptoms must be present in the early developmental period, but may not fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life.

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability, intellectual developmental disorder or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make co- morbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level as stated by the Center for Diseases Control manual of America (2010)

Munsaka and Matafwali (2013) further explain that the condition falls under a broader category spectrum of developmental disorders known as Pervasive Development Disorders (PDDS). While in the DSM-IV there were three main subtypes of autism spectrum disorders namely Autistic disorder, Asperger disorder and Pervasive developmental disorder – not otherwise specified in the new DSM-5 criteria there are no such types. A series of monitoring programmes conducted throughout America in reviewed 2010education and health records and identified that autism is the most common of the pervasive developmental disorders and do affect an estimated number of one out of 68 children. Hewitt (2009) also elaborates that, autism knows no racial, ethnic, or social boundaries, family income levels, life style choices, or educational levels, and can affect any family and any child. It is four times more prevalent in boys than girls.

The word ‘autism’ according to Kendra (2013) has its origin in the Greek word *‘autos’*, which means self. Children with autism often are self- absorbed and seem to exist in a private world where they are unable to successfully communicate and interact with others. Children with autism may have difficulty developing language skills and understanding what others say to

them. They also may have difficulty communicating nonverbally, such as through hand gestures, eye contact and facial expressions. Often these children exhibit challenging behaviour due to difficulties in communicating and socializing. Due to lack of detailed assessment procedures the study focussed on autism.

1.1.2 Communication problems of children with autism.

According to Gans and Simpson (2004) communication is the exchange of information between people by means of speaking, writing or using a common system of signs or behaviour. This is done by the use of body language (also known as non verbal communication). Nonverbal body language includes gestures and movements such as making eye contact, nodding occasionally to acknowledge a strong point in the conversation, pointing, turning your head to look at someone, scowling in frustration or throwing and stopping when upset. Besides body language, communication can happen in form of speech and being attentive when others are speaking to you so that you know if people understand what you are saying. In addition, one should be able to be consistency in the use of words and the meaning of sentences. This means that when a person says bread it should mean bread not a car.

According to Preis (2006) children with autism do not just have verbal communication impairment (difficulty in talking) but the condition also affects receptive language (difficulty in understanding spoken language). This means that children with autism may have difficulty responding to spoken commands and requests, understanding questions and statements, and following a topic in a conversation. Furthermore, Tager and Flusber (1981) found that there is a difference in the way children with autism process incoming information, specifically the semantic aspects of language. In addition, individuals with autism struggle to gain meaning from linguistic and social information due to the transient nature of these domains. This is fully supported by Grandin (1995) who talked of spoken language sounding like a medley of unconnected sounds. Quill (1997) also contributed by saying that the memory skills of children with autism tend to be indistinguishable from those of their non disabled peers, especially for rote memory, cued memory, cued recall, and associative learning.

Light (2003) explains that, not every child with an autism spectrum disorder will have the same or a severe language problem. Children's ability to communicate will vary depending on intellectual and social development. Some children with autism may be unable to speak, others may have rich vocabularies and be able to talk about specific subjects in great detail, and yet

most children with autism have little or no problem pronouncing words. The majority; however have difficulty using language effectively, especially when communicating with other people. Many have problems with the meaning and rhythm of words and sentences. These children may be unable to understand body language and the names of vocal tones.

Experts estimate that as many as 25% of all children with autism may never develop verbal language skills (cdc.gov/ncbddd/autism/see.html, 2012). Frost (2000) indicates that some of these children, the goal may be to acquire gestured communication such as the use of sign language. For others the goal may be to communicate by means of a symbol system in which pictures are used to express thoughts. Picture systems can range from picture boards or cards to sophisticated electronic devices that generate synthesized speech though the use of pressing pre-programmed buttons.

Teaching children with autism communication skills is essential in helping them reach their full potential in life. There are many different approaches to improve communication skills in a child with autism. The best treatment programs according to Light, Beukelman andReichle (2003) begins from 18 months to age 3 as the most critical years in terms of early intervention for children with autism. The earlier a child with autism receives intervention the more likely they will be able to verbally communicate. This is a huge challenge in Zambia, given the few to no early intervention resources for children with special needs depending on where one lives. There is alsolimited to no assessment and proper diagnostic centres. Given these systems challenges, models in Zambia designed to help children with autism develop communication skills will need to focus on involving teachers and home based workers that are trained to work with parents/caregivers as well as family members in the treatment programme so that the programme becomes part of the child's daily life.

Communication skills being an essential part of independent daily living, children with or without autism need to learn functional communication skills in order to be a real part of their community. Children with autism face a lot of problems in communicating and teaching communication can help improve social interaction and hence, this area needs to be taught to such children (Mirenda 1998). Frost (2000) indicates that children with autism need to be taught functional communication skills since they usually have limited social interaction and play skills.

Knowing and using a picture exchange method of aiding functional communication is one way of initiating communication within the school and other environments where a child with autism might be found. Since everyday life consists of people expressing their needs to others. The picture exchange method has been used in developed countries a lot. In Africa according to information accessed through the autism organisation of America (2010),the picture exchange method as a way of helping children with autism to communicate has been used in Botswana, South Africa, Nigeria, Uganda and Kenya. In South Africa, a study was conducted by Travis and Geiger (2010) that investigated the effects of introducing the Picture Exchange Communication System (PECS) on the frequency of requesting and commenting of two children with autism who were presented with some spoken language, but limited use of language in communicative exchanges. Data was collected regarding the picture exchange communication strategy at pre-training, training, post-training and follow-up stages, in both structured and unstructured settings. The quantitative data was visually represented and analysed to determine the effectiveness of the PECS. The findings indicated highly effective treatment for requesting. There were also considerable increases in intentional communicative acts for both participants, with marked increases in requesting (function) and the development of forms of communication. The study clearly demonstrates that the Picture Exchange strategy is effective for teaching communication to children with autism. While here in Zambia no such studies were conducted in order to find out the effectiveness of the picture exchange strategy as it is not even known well enough to be implemented in schools.

1.2 Statement of the problem

Zambia has no empirical evidence to show that the use of picture exchange strategy has been used in Zambia to reinforce communication skills among children with special needs, especially those with autism. Efforts to communicate by such children have been problematic. It is for this reason that the study has been conducted to try and establish the effectiveness that the picture exchange strategy can reinforce communication in skills development among children with autism in Zambia. It is hoped that, picture exchange communication intervention strategy can help such children to be able to communicate their needs and feelings.

1.3 Purpose of the study

The purpose of the study was to assess the effectiveness of using a picture exchange strategyas augmentative and alternative communication strategy to teach children with autism in Bauleni compound of Lusaka, Zambia, to communicate their needs to other people as a way of enhancing their communication skills.

1.4 Objectives of the Study

The following objectives guided the study:

(i) To determine how useful the picture exchange strategy could be as a communication tool for children with autism.

(ii) To establish the extent to which teachers can be effective if using the picture exchange for communication in teaching children with autism.

(iii) To examine whether a picture exchange system is a socially accepted communication method for Zambian parents to use in their homes.

(iv) To identify challenges if any in the implementation of picture exchange method in the Zambian context.

1.5 Research Questions

The following research questions served as a guide to the study:

(i) How can picture exchange strategy be used a communication tool for children with autism?

(ii) To what extent can the picture exchange strategy be useful for communication in teaching children with autism in Zambia?

(iii) How can the picture exchange strategy for communication a socially accepted method for Zambian parents to use in homes?

(iv) What are the challenges in the implementation of picture exchange strategy in the Zambian context?

1.6 Significance of the study

It is hoped that the findings of this study may benefit parents because information arising provides them with a sense that their children ***may*** be able to initiate communication through the use of picture exchange method. Findings of this may enable Special Education planners in Zambia, to improve service provisions for children with autism by including augmentative and alternative communication in the curriculum and by also paying attention to such children so that they are being appropriately taught in the present education system. The study may enlighten other professionals like the Paediatric Centre of Excellence to explain to the parents the use of alternative communication strategies that would help a child with autism. The study may also inform other developing and developed countries about the effectiveness of using picture exchange communication systems in Zambia.

1.7 Limitations

This study was conducted on a selected group of learners with autism in Lusaka, Zambia. For this reason, the results of the study may not be generalized to all learners with autism and all Zambian communities. Environmental differences have different effects on children with autism. Additionally, the study was qualitative using case study methods and therefore the sample was small and limited, also limiting generalization ability of findings. Considering the individual differences among human beings, it may be possible that other children may respond differently in the same circumstances as the respondents in this study. Lastly, there are no diagnostic and assessment centres for autism in Zambia. Thus, this study had to rely on the observations and judgements of the researcher or a previous diagnosis as to whether or not the children included in the study had autism. The previous diagnoses were from the University Teaching Hospital centre of excellence. The doctors had diagnosed all the children in this study to have autism.

1.8 Operational definition of terms

In this study the following terms mean

1.8.1 Child with Autism: Autistic Spectrum Disorders **(ASD):-** is a group of pervasive development disorders diagnostic criteria include communication problems, ritualistic behaviours and inappropriate social interaction. For the purpose of this study a child with autism will be a child that the researcher observes to have the symptoms of autism or a child that has previously been diagnosed with autism.

1.8.1 Communication: - is a process of transferring information from one person to another. (Haddock, 1975)

1.8.3Communication partner: - is an individual to whom the child directs the picture in order to communicate, this might be to a teacher or a parent.

1.8.4Home Based Education Programme:- is a programme that is carefully tailored to meet the Individual Needs of a child through the teacher based assessment procedures and is also a programme that supports parents and care givers to be the key teachers in order to know how to use the home environment for easy grasping of skills by their children.

1.8.5Picture Exchange Communication System (PEC):- is an augmentative and alternative communication system to help individuals who are unable to use verbal speech to communicate properly, to acquire a functional means of communication.

1.8.6Prompter: - an adult who helps the teacher to aid the child to start using the pictures for communication.

1.9 Theoretical frame work

The study used a theoretical framework of applied behaviour analysis (ABA). ABA is based on the initial work of Burrhus Frederic Skinner (1948) who developed programmatic animal laboratory research to elaborate on operant conditioning. Skinner was interested in studying the behaviour of individual organisms and determining the antecedent and consequent events that influenced behaviour. The substance of his theoretical account on behaviour was referred to as operant conditioning while the methodological approach toward experimentation and data evaluation was referred to as the experimental analysis of behaviour. Skinner's research goal was to discover lawful behavioural processes of the individual organism. He focused on animal

behaviour and primarily on the arrangement of consequences that followed behaviour and influenced subsequent performance (Morris, Smith and Althus, 2005).

According to Mark and Donald, (1998), Applied Behaviour Analysis is the application of the science of behaviour to improve the quality of behaviour, to stop an unwanted behaviour, or teach new behaviour. ABA is a frame work for the practice of a science and not a specific programme. Therefore in this work the Antecedent, Behaviour and Consequence (ABC) Functional behaviour Analysis was used in order to enable children with autism to effectively use the picture exchange strategy for communication.

From the applied behaviour analysis theoretical framework, it can be concluded that behaviour can be changed or moulded by the consequences. In this study, each parent was asked to come up with a type of food that their child liked to eat on daily basis. The child's desired food was used as a reinforcer. When the child made an effort of picking up the picture of the desired food or pointing at it the parents immediately gave the food to the child. The immediately giving of the food to a child was a positive motivator to a child. In order for the child to learn the strategy, two adults were assigned to the child in order for them to physically prompt the child or provide cues in order for the child not to make mistakes as he/she was learning to use the picture. When the child was able to start using the picture, fading was applied followed by the child being left to use the skill independently.

Summary

The chapter reflected an account of what the research is about and its relevance. The chapter presented the rationale for the research, beginning with the background to the study, proceeding to cover statement of the problem and the purpose of the study. The chapter further covered objectives of the study and the study questions which the study sought to respond to. Significance of the study, limitations and the theoretical framework of the study were also covered. The researcher ended the chapter with operational definitions of the terms in the study.

CHAPTER TWO
LITERATURE REVIEW

2.0. Overview

A number of scholars have investigated the effects of the picture exchange strategy on the communication skills of autistic children. Therefore this chapter highlights literature to this effect and how their perspective relates to the present study which focuses on the effect of picture exchange strategy on Zambian children with autism. The information gathered from the literature is used to define a benchmark from which the same strategy can be used in Zambia to help children with autism that have communication problems. The specific objectives of the study have been used to organize this literature review as follows: The Picture exchange strategy, Teaching Augmentative and Alternative Communication using Picture Exchange and The use of Picture Exchange strategy for Communication in homes.

2.1Historical perspective of Autism

Historically, autism was identified by Leor Kanner in 1943 and named it as "early infantile autism". He described a group of children as having difficulties in social relationships which was in marked contrast to their ability to relate to objects. He also observed that these children had difficulties with speech and language skills. For many years confusion centred around the possibility that autism was the earliest manifestation of schizophrenia. However, studies conducted in America by Kolvin (1999) proved that schizophrenia and autism differ in clinical and features, course and family history. Following Kanner's research, in 1944 Hans Asperger a Viennese paediatrician described a group of boys who had unusual social, linguistic and cognitive abilities. He used the term "Autistic Psychopath" to describe a form of personality disorder. But in Wing's studies (1996) based on Hans, she argued that the spectrum of autistic conditions existed as developmental disorders and not psychoses. It is interesting to note that Hans Asperger used the term "autistic" which Kanner also used in his publication. Both authors used the same term to describe the symptoms of autism. However, Leo Kanner's idea presented children with more severe expression of autism, while Hans Asperger presented more able children. Leo Kanner's work (1944) subsequently dominated the view of autism being diagnosed as lack of responsiveness to other people, severe language deficits, and classic silence and aloofness.

Later in 1981 Lorna Wing published a paper that presented children and adults who had similar characteristics of profile abilities and behaviour originally described by Hans Asperger. Wing (1998) was the first person to use the term Asperger's syndrome. She found that some children had the classic autistic features when very young, but later developed fluent speech and a desire to socialise with others. On one hand, they had progressed beyond a diagnosis of classic autism based on Kanner's work: while on the other hand, they still had significant problems with more advanced social skills and conversation. These characteristics accurately resembled the original work of Hans Asperger. It is worth noting that Wing seems to imply that early intervention for children with ASD seem to play a significant role in their social and language development, rather than when they reach adult age. Ideally, intervention at adult age where they may need advanced skills according to age can present challenges for both educators and all care givers for persons with ASD.

Otherwise, previous studies have succeeded in providing the historical perspective of the autistic spectrum disorders and subdivided them according to characteristics and ability while they have failed to determine the exact causes making it difficult to understand the disorder fully.

2.2 Autism Spectrum Disorder

Autism is a short way of saying "autism spectrum disorder." Its symptoms as stated by World Health Organisation (WHO, 1994) manifests as impairment in social skills, communication, repetitive routines and restricted interests. Autism is also a spectrum disorder. In basic terms, this means you can be a little autistic or very autistic. Until May, 2013, there were five different autism spectrum diagnoses. At one end of the spectrum was Asperger Syndrome. At the other end of the spectrum was autistic disorder, known for profound developmental delays and challenges. In between were a variety of pervasive developmental disorders including Rett syndrome, Fragile X syndrome, and pervasive developmental disorder not otherwise specified. Today, with the publication of the DSM-5 (Diagnostic Manual Version 5 page 16) there is only one diagnostic category for people with autism: autisms spectrum disorder. Anyone with symptoms consistent with autism will receive an ASD diagnosis along with a functional level of 1, 2 or 3 and, if appropriate, specifies. Some common specifies include cognitive disabilities, seizure disorders.

2.3Screening of children with autism at an early age

Half of parents of children with ASD notice their child's unusual behaviour by age 18 months and about four- fifths notices by age 24 months (Landa 2008). She further explains that, failure for children to meet any of the following milestones is an absolute indication to proceed with further evaluations:

(i) No babbling by 12 months

(ii) No gesturing (pointing, waving, etc.) by 12 months.

(iii) No single words by 16 months.

(iv)No two-word (spontaneous, not just echolalia) Phrases by 24 months.

(v) Any loss of any language or social skills, at any age.

2.4. Diagnosis of children with autism

Diagnosis is based on behaviour, not cause of mechanism, Baird (2003).As indicated before; autism under DSM-5 is characterized by persistent deficits in social communication and interaction across multiple contexts, as well as restricted, repetitive patterns of behaviour, interests, or activities. These deficits are present in early childhood, typically before age three, and lead to clinically significant functional impairment.

In other countries they are several diagnostic instruments. Gotham (2008) states commonly used instruments as the Autism Diagnostic Interview- Revised as a semi structured parent interview, and the Autism Diagnostic Observation Schedule that uses observation and interaction with the child. The Childhood Autism Rating Scale is used widely to assess severity of autism based on observation of children. As supported by Munsaka and Mwatafwali (2013) children with autism in Zambia remain undiagnosed or inappropriately diagnosed because of lack of standardised instruments to be used. This on its own impedes proper intervention programmes to children with autism. In this study, after getting the diagnosis from the University Teaching Hospital regarding the selected target group the researcher had to further ascertain that by using a checklist from autism "M" chart down loaded from the autism org.

2.5. Characteristics of children with autism

Many children with ASD although motivated to make friends within their groups, their social clumsiness and difficulty with appreciating other individual's point of view tends to result in social isolation. Difficulties in forming friendships with other people constitute a central feature

of autism and considerable effort has been devoted to devising methods for improving communication skills of individuals who have autism. Wing (1996) elaborates that early studies of involving children with ASD into learning a way of communicating enables them to form friendships and to overcome anxiety.

The subgroup classification of individuals with autism presents a wide range of ability levels in terms of cognitive and social functioning. This is because the differences range from severe learning disability to average and above average intelligence. Despite these discrepancies in ability levels, they all share the triad of impairments in social interaction, imagination and communication. It is noted that, current studies under the DSM-V has removed the sub groups of autism in the diagnostic criteria due to the failure to establish accurate diagnosis particularly at the extreme ends of the ability range because of the nature at which the boundaries of autistic spectrum disorder overlaps each other as explained by Berlinger and Smith (2001).

Recent studies (2013) have shown that the skills of communication, social interaction and imagination are like other developmental skills, dependent upon aspects of the function of the brain. Munsaka et al. (2013) explains that the cerebellum in children with autism is smaller than normal in majority of such children. They went on to explain that abnormality of the cerebellum is believed to be the cause of the problem that children with autism have in shifting their attention from one stimulus to another. Another area of the brain mentioned is the medial temporal lobe and connected limbic system that has structures meant to control emotion regulation, learning and memory. These areas are also believed to have challenges. In addition, to the other areas of the brain mentioned, the white matter has been included to being a contributing factor of children with autism not being able to synchronise between the brain areas involved in language. Although, areas of the brain have been mentioned, the exact areas involved have not yet been identified; this makes it difficult for a diagnostician to produce an accurate assessment unless they are fully aware of the underlying autistic conditions.

2.6 Education Intervention for Persons with ASD

The start of education provisions in children with autism is based on the understanding that everyone needs predictability in his life. Some people with autism have written books expressing their needs in relation to education support. For instance, Lawson (2004) wrote: “the keys that will aid understanding of ASD are located within the concept that autistic is to excel in visual skills”. Similar views were also expressed by Grandin (1982) in her book *“Thinking in pictures”*

whereby she explained that people living with autism perceive the world and organise their thoughts in picture form rather than in abstract. This is also fully supported by Hollins (2007) who carried various studies on the way people with autism perceive the world and help them to communicate. She discovered that the use of pictures helped most of the children under her study to communicate. Thereafter Hollins wrote several books to help people living with autism to communicate and to also help such children to be able to enjoy reading books, in her books entitled *"Books without words".* However, education and treatment programmes for people with ASD calls for direct teaching of skills in a structured natural environment, communication and social skills training including anxiety and stress reduction.

Attwood (2003) points out that individual with ASD "perceive the world differently from everybody else". Robinson and Trower (1988) argue that communication is the most central and important characteristics of human beings. Hollins (2007) contend that the ability to interact successfully with peers and significant adults is one of the most important areas of student's development. These statements indicate that people living with ASD are at a clear disadvantage in coping with their world. The impact of these deficits can range from not being able to understand other people and also being misunderstood by other people. Therefore intervention for pupils with ASD needs to focus on teaching communication skills so that it aids to the development of social skills and imagination (Hollins, 2007.)

2.7The use of picture exchange strategy for communication among children with autism

Communication is considered an important aspect of human interaction. One of the main challenges that people with autism have is communication. Hollins (2007) elaborates that the inability to communicate by autistic children is neither due to deafness nor speechlessness. She further states that it is basically due to a neurological condition that impedes the brain from generating meaningful speech and sound at the required moment. In order to overcome this communicative difficulty, researchers, teachers and clinicians have made an attempt to use the picture exchange method. The Picture exchange strategy to communication was developed in 1994 by Andy Bondy and Frost in America, as an Augmentative Alternative Communication (AAC) system that teachers, children and adults with autism and other communication deficits can use to initiate communication. It is a strategy that uses any picture drawing, photograph or any picture cut out of a news magazine. The user of the strategy initiates conversation or makes their needs known by giving a picture of what they want to communicate to another person. The

person given or shown the picture will respond accordingly by providing that item to the child or adult who initiated the communication. The pictures that are used have a word or sentence written below so that the interpretation of the picture is the same to everyone. The strategy has received world-wide recognition for focusing on the initiation component of communication. It was created with educators, resident care providers and families in mind.

Picture exchange strategy is designed to teach functional communication with an initial focus on spontaneity. It has been and continues to be implemented in a variety of settings (e.g. homes, schools and communities) to enable the users to have the skills to communicate their wants and needs. This method is easy to use, widely available and is generalizable across environments, which makes it appealing. According to Bondy and Frost, (2001) Picture Exchange communication system is the exchange of a picture for requesting a reinforcing item. This is conducted by the child being shown a highly preferred item that is motivating. The child is helped to pick up the correct picture of the motivating item, and reaches toward the communicative partner, releases the picture into the trainer's hand and the second adult. The picture exchange strategy does not require complex or expensive materials since it uses picture symbols as the modality. This makes it to be a suitable strategy for the Zambian children especially those in poor localities and rural areas.

A study by Howlin and Gordon (2007) showed that many children introduced to picture exchange strategy as pre-scholars went on to develop speech. This means that the picture exchange method does not hinder speech development making it a flexible strategy to those who have limited speech. Many studies that have been conducted by different people in order to find out the effectiveness of picture exchange strategy in teaching communication to children with autism. In her book, *Thinking in Pictures*, Grandin (2006) elaborated on how profound mysteries of autism has been the remarkable ability of most autistic people to excel at visual spatial skills while performing so poorly at verbal skills. Hollins (2007) came up with books without words to enable individuals with autism to be able to tell their stories. Adkins and Axelrod (2000) conducted a study to examine the acquisition of communication skills by a child with pervasive development disorder. The subject was taught to request for preferred items using American Sign Language and the picture exchange method. The results showed that the child was able to request for more preferred objects by the use of picture exchange method than the sign language. Potter and Brown (1997) conducted a study where a child with autism was taught to vocalise words and

also use picture exchange method. After three weeks that child had learned to speak 3 words while he had known how to communicate effectively with picture exchange method using 15 pictures. This study demonstrated that a child with autism would find it easier to communicate using pictures rather than using the verbal language.

While the picture exchange method was perceived to be the best method of teaching communication to children with autism, there are some critics concerning the method. These critics argued that the use of picture exchange method interferes with the development of continuation of speech. Carter (2009) in his review of the efficacy of the picture exchange communication system intervention reviewed twenty seven studies that included randomized controlled trials, other group designs and single subject studies. The research provided preliminary evidence that the effect on speech development was not evident. On the other hand, Tincani and Alazetta (2006) stated that 40 years of research has yielded no evidence that picture exchange method interferes with the development of continuation of speech. As noted by the several studies conducted and analysed by Sony (2006) it was clear that there is a positive correlation between picture exchange method use and speech development.

2.8 Teaching Augmentative and Alternative Communication using picture exchange for children with autism

According to Fosset, Brenda and Mirenda (2009) Augmentative and alternative communication (AAC) is an umbrella term that encompasses the communication methods used to supplement or replace speech or writing for children or adults with impairments in the production or comprehension of spoken or written language. They further explain that AAC is used by those with a wide range of speech and language impairments, including congenital impairments such as autism and acquired conditions such as lateral sclerosis. AAC can be a permanent addition to a person's communication or a temporary aid. Beukelman, Yorkston and Reichle (2000) explain that AAC systems are diverse and they include unaided communication uses. This means that in this type of AAC there is no equipment involved, only signing, body language or other non verbal cuing is used. Conversely, aided approaches use external tools and range from pictures and communication boards to speech generating devices. The symbols used in this type of AAC include gestures, photographs, pictures, line drawings, letters and words which can be used alone or in combination. In addition to the above, there are low and high tech communication aids. High tech communication aids permit the storage and retrieval of electronic messages, with most

allowing the user to communicate using recorded speech output. These are often computerised and are generally expensive to buy. While low-tech communication aids are defined as those that do not need batteries, electricity or electronics. These are very simple communication boards or books, from which the user selects letters, words, phrases, pictures or symbols to communicate.

The picture exchange is an augmentative communication system developed to help individuals quickly acquire a functional means of communication (Frost 2000). In the United States of America it was proven that picture exchange was appropriate for individuals who do not use speech or who may speak with limited effectiveness. Those who have articulation or motor difficulties, limited communicative partners, and lack of initiative in communication can also use the picture exchange strategy for communication. The strategy is based on B. F. Skinner (1957)'s applied behaviour analysis (ABA) approach using rewards to reinforce desired behaviours, aim of errorless learning and use of prompts to facilitate learning.

Tincani (2006) states that the first lesson of teaching picture exchange communication programme is to spontaneously request for items or activities the child really wants. According to this study, the teacher identified whether an individual child was willing to make a request in terms of the best food he/she likes. When the child's best food is identified, two family members are required to work with the child. The first adult (the person to whom the child address most of her/his request) entices the child with the food that he/she really likes. The role of the second adult according to Cafiero (2005) is to stay behind the child and wait for him/her to reach for the food and then to physically assist the child to pick up the picture of that type of food and hand it to the first adult. When the first adult receives the picture he/she immediately gives the child the reward, along with an appropriate comment. (i.e. "Oh you want nsima"). As soon as possible the physical assistance from the second adult should be faded out until the child is exchanging a picture for the item independently with the first adult.

The goal of this approach is for the child to initiate communication for him/her by spontaneously asking using the picture exchange and not simply respond to the requests, as teachers and parents need to resist the urge to ask. What do you want? or to use other verbal prompts. The child should from the beginning seek the communication partner out.
Once the child can reliably exchange a single picture, independently making a request of a very rewarding object (in this study asking for the preferred food) the move is made into the second

phase of the process. In the second phase, the child is now encouraged to use greater spontaneity and persistence, and to generalize the skill he/she has acquired. Mills (2006) states that if the child continues to request very motivating items or activities only now he/she is required to move a longer distance to get to a communication partner or to get to the picture. Once increased distance is established, the next step is to make requests in settings different from that in which he/she was taught the initial phase with a variety of different people, friends or grandparents. The final step is for the child to begin expanding his/her vocabulary of symbols, by requesting different reinforcing objects or activities.

Table 1: Overview of the Picture Exchange Teaching Method

Steps	Teaching activity Used in Picture Exchange Method
1	Teacher identifies what a child is willing to make a request for in terms of the best food for that child. This was done with the help of parents/care givers who identified the food.
2	Two adults to be identified to work with the child. One of the identified adult was either the parent or a care giver and another adult came from the ones that were identified by either the parent/caregiver.
3	The first adult to entice the child with the food
4	The second adult to stay behind the child and to wait for the child to reach out for the food and then physically assist the child to pick up the picture of that type of food and hand it in to the first adult.
5	The first adult immediately takes the picture and immediately gives the food to the child. The child is rewarded for doing that by giving the food.
6	The second adult should fade gradually by first fading the physical assistance.
7	The physical assistance is faded completely when the child exchanges a picture for the requested food independently with the adult.

Adapted from Frost and Bondy manual. (2002, 2)

Once the child is able to discriminate easily between and making requests for a variety of items, to a variety of people and in a variety of environments the program begins to focus on sentence structure. The child is taught to use sentence strips to make longer requests item or activity. The

two pictures will be attached to a sentence strip and the entire strips would be exchanged with the communicative partner for the pictured item or activity.

The second to last steps of the teaching strategy as elaborated by Frost and Bondy (2002) occurs at the same time, focusing on different extension of the child's skill with picture exchange. The last phase extends the sentence structure begun in the previous phase. Adjectives and other words can be added to the child's repertoire to help him/her to further refine the requests. For example to say, "I want nsima and chicken". The last phase is a fundamental shift in the child's communication and the expected outcome from the teachers or peers. Through the pictures the child will end up to comment on elements of his/her environment.

For this particular study the low –tech communication aids that use pictures in order for children with autism to ask for their desired food was selected as preferred communication aide. This was chosen because it is cheap and can be made anywhere in Zambia where there is need. Teaching the PEC systems was also selected because it is practical and can be done in very remote villages with minimal parent/family training. Once they learn to do it with one picture, others can be added using the same methods.

2.9The use of Picture Exchange strategy for Communication in homes

The use of the picture exchange strategy (PEC) addresses the demands of the social community of which the child who participates in PEC in this is part (Wing and Gould, 2000).According to numerous studies PEC can be used to enhance communication to and from children with autism that have a wide variety of needs and abilities. This technique can increase the social communication skills of these individuals. Body and Frost (2000) in their study reported that parents appreciated the strategy because their children learned verbal language. Mills and Wing (2006) also reported on the parents 'experiences of using the strategy. The parents explained that the materials used to design the pictures that the pupils use was affordable and easily understood by anyone who comes across the child. Using parents to be active in the initial stage prompts pupils to be more involved in learning successfully. This helps the children to be more involved and to practice with other people. The children are then motivated to use the strategy with the wider community.

Autism epicentre (2011) agrees with Mills and Wing (2006) that the strategy is acceptable in the community as it helps children to communicate their needs and wishes easily that's diminishing the inappropriate behaviours. Apart from that, the strategy supports speech, this enables the children to further develop social interaction at all levels. All in all the literature was limited. Therefore this study will feel the gap in literature in terms of how the strategy can help children with autism to learn how to communicate their needs and wants.

2.10 Challenges faced by teachers and parents in conducting the picture exchange strategy

Tincan and Alazetta (2006) states that the picture exchange strategy (PECS) can be effectively used to increase communicative initiations of individuals with autism. PECS can also potentially increase vocalizations of individuals with autism. This assumption is also supported by Miranda (2001) who also adds to say, the effectiveness of the implementation of PECS involves careful preparation of training materials, identification of reinforces, involvement of others to act as helpers and communication partners, many opportunities for communication exchanges and monitoring of learner progress across the six phases. However, even when the implementation of the strategy sounds to be simple parents and teachers experiences some challenges. The training period takes a long time and most of the times the parents and caregivers are not always at home to follow up what the intervention demands of them. Koul, Schlosser, and Sancibrian (2001) observed that most parents find it a challenge to select either an actual picture or a symbol and besides that most of the learners frequently lose the pictures. The training of how to use PES consists of different phases, it is emphasised that during intervention there should always be two adults to help with the implementation of the strategy. This is not practical in a home where there arenot enough adults.

No literature was found of the Zambian or African context on specifically the challenges faced by both teachers and parents in teaching PES to children with autism. However Nyoni (2012) mentioned in his report generally the challenges in communication of children with autism which are not similar to challenges of implementing the PES.

Summary

The early section attempted to give a brief history of autism spectrum disorder how it came to being, screening, diagnosis of the children with autism and how education provisions can help out such children. However the chapter further reflected the use of picture exchange strategy in helping children with autism to communicate and how this could be implemented. The chapter ended by providing evidence of the strategy in other countries. In conclusion it is evident that the strategy helped children with autism to communicate. It is also evident from literature reviewed about autism in Zambia that children are there but the field lack appropriate diagnosis procedures and appropriate intervention strategies to help out such children in terms of communicating their desired needs and feelings. This gap in service provision in Zambia is what prompted this piece of study in order to find out the effectiveness of picture exchange strategy to help children with autism to communicate.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Overview

This chapter examines the research design and the target population that were used in the study. It also gives further details of the sample size, sampling procedure, research instruments, data collection procedures and data analysis that was used in order to find out the effects of Picture Exchange strategy on Communication of children with autism.

3.1 Research Design

The study utilized multiple qualitative methods to triangulate findings. These methods included case study intervention and in depth interviewing. Specifically, the case study design was used to gather data in a natural environment which engages natural behaviour. This approach was chosen because the study itself used the methods of applied settings recommended for a case study research design. According to Kazdin (1989) this design is used when there is need to study reality from inside in order to understand it from a point of view of the subject and to capture reality as it is. This method was found useful in the presentation of the actual outcomes of the effectiveness of the picture exchange strategy in helping children with autism to communicate because of observing the participants during the base line phase, intervention stage and after intervention. This meant that all the participants were observed over a period of two weeks to find out what they do when they are in need of their preferred food. The base line phase was followed by the intervention stage where pictures were used in order to ask for their preferred food and this was supposed to be for three months. After the intervention the last stage was a follow up stage to try to find out if the picture exchange strategy was still being used by the child with autism even when the child was not reminded to use the picture. This stage was supposed to be for two weeks.

3.2 Target population

The target population consisted of children with autism aged eight to ten years. The children were identified through the use of the Autism M- Chat screening tool (Robins, Fein and Barton in 1999(and DSM IV criteria for ASD (APA 2012). The M-Chart was used for only screening the children after which the DSM IV criteria were applied by the researcher to clearly ascertain if the child had autism. The children in the target population were currently participating in the Home Based Education Programme. The assigned volunteer teachers from the Home Based

Education Programme were taught by the researcher to implement the target intervention and the parents/care givers of the children also learned the process.

3.3 Sample size

The sample comprised four (4) children aged between eight and ten who participated in the Bauleni Compound Home Based Education Programme. All the children who participated in the study had autism disorder, with no expressive language. Further, their parents/care givers and the volunteer teachers participated in the study. Below is the sample size distribution by gender.

Table 2: Distribution of the sample by gender.

	Male	**Female**	**Total**
Teachers	2	2	4
Parents/Care givers	4	4	8
Children with autism	2	2	4
Total	8	8	16

3.4 Sampling procedure

In selecting the sample for the study a number of considerations were made, among them were the availability, accessibility and the readiness of someone to participate in the study. As Rumrill (2001) noted, the selection of the subjects for research participation is determined by the nature of the questions that set forth the scope of the task and as such, availability of the subjects. In determining the Effects of Picture Exchange strategy on the Communication Skills of Children with Autism, it was realized that children and their parents including volunteer teachers involved should form the major population that was studied. This was based on the assumption that the collaboration between the volunteer teacher and parents/caregivers would result in successful implementation of the picture exchange strategy which would enhance the communication skills of children with autism.

Therefore, purposeful sampling procedures were employed to select the sample. Rumrill (2001) defines purposeful sampling as criterion based selection used when access to participants may be difficult to achieve or when the number of individuals being studied is relatively small so much that random sampling could prohibit the inclusion of the very participants about whom the researcher is attempting to learn. For example, accessing children who have been diagnosed to have autism between eight and ten years old can be difficult due to lack of doctors who are

specialized in dealing with autistic children. Purposive sampling permitted the specific selection of research participants who were known and available and therefore convenient to the researcher. The table below summarizes each participant's characteristics.

Table 3: Participant Characteristics

Participants	**Child Description**	**Family Characteristics (parents)**	**Volunteer Teacher**
Lillian Age – 8 (girl) Diagnosis – Autistic disorder	Behaviour concerns, possible aphasia, throws tantrums whenever she wants to eat	Married Both not working, Staying in Bauleni Compound	(female) Trained in special Education
Yorum Age – 9 (boy) Diagnosis – Autistic disorder	No verbal skills. Throws tantrums whenever he wants food,	Married Both parents work, Staying in Bauleni Compound	Basic education (male)
Chilufya Age – 8 (boy) Diagnosis – Autistic disorder	Severe language deficit, Throws tantrums whenever He sees food	Married Both of them work, Stay in Bauleni	Assistant in special needs classroom, (female)
Mary Age – 10 (girl) Diagnosis – Autistic disorder	Says some words but without meaning, Once in a while throws Tantrum when she sees food.	Father work but Mother died, stay in Bauleni.	Assistant in a special needs classroom (male)

NB. All the above names have been changed in order to protect the participants' confidentiality.

3.5 Research Instruments

The Antecedent, Background and Consequence approach (ABC) to behaviour analysis chart was used as it is a direct observation tool used to collect information about the events that are

occurring within a child's environment. "A" refers to the antecedent or the event or activity that immediately precedes behaviour. The "B" refers to the environment where the behaviour has taken place and "C" refers to the consequence or the event that immediately follows a response. The same instrument was also used as it could provide appropriate data that could be of use before intervention, during intervention and after intervention.

The ABC chart was also used to organize information over several observation sessions by recording the types of behaviours observed and the events that precede and follow the behaviour so as to come up with a base line for observing and recording. ABC data assisted in forming a statement and gathering evidence that picture exchange method can be used in Zambia to help children with autism to be able to communicate.

Apart from the ABC chart, interview schedules were used to collect data from parents, guardians and teachers on what they felt was the social validity of the picture exchange strategy.

3.6 Data Collection Procedures

Before the observation period parents/caregivers had a meeting with the researcher during which informed consent was obtained for the case study. Furthermore each parent/care giver was asked to name one type of food that the child eats on daily bases and the food that was the child's most preferred food item so that the children would practice the use of the strategy on daily basis. This would help in observing the behaviour that the child would present on daily bases so that informed decisions could be arrived at regarding the effectiveness of the strategy. All the parents identified the food as indicated in Table 3 below:

Table 4. Child's Preferred Foods

Child	**Preferred Food**
Lillian	Nsima with chicken
Yorum	Sausage and chips (potatoes)
Chilufya	Nsima with any type of minced meat
Mary	Biscuits (cookies)

The above preferred food was used on daily basis throughout the study in order to find out at every stage of the study on how the child could use the picture of the desired food.

Observation sessions: Observations were conducted once a day for a period of four months and the time varied according to how many minutes the child was on task meaning how much time was used by an individual child when it was time to have his/her preferred meal. These were recorded by the parent/caregiver with quality checks conducted by the teacher and researcher. Recordings were only made once a day because it could be guaranteed that the parent/caregiver would be home. During other times of the day it was not possible to ensure parents/caregivers would be found at home. In this respect it was agreed among the participants that coding on the ABC chart would be done once in a day by the parents and once a week by the Home Based teacher who would also observe the child and code with a different colour on the same chart. The length of time for each observation session depended on the amount of time the child was on the task. All the observations took place in a home environment when it was time to eat that particular food the parents/caregivers had agreed to use for this study. The familiar plates and dishes were used throughout the study. In addition to the teacher, only the parents/caregivers who were familiar to the child were the ones who introduced the strategy to the child so that the child could have a routine to follow. Parents were provided training by the researcher and teacher as to how to conduct and implement the intervention strategy. Demonstration and feedback were provided to the parents/caregivers until they were able to successfully demonstrate proficiency.

Baseline: Baseline consisted of observing each child for two weeks to come up with a clear statement of what the child does when he/she was in need of the particular food that was used in this study. For a period of two weeks recordings were made on each child.

Intervention: After two weeks of observing what the child does when he/she wants the food, an intervention programme was introduced to the child by using the parents/caregivers. At the initial stage two parents/caregivers worked together. One parent enticed the child with the food while the second parent/caregiver stayed behind the child and waited for him/her to reach for the food and then physically assisted the child to pick up the picture and gave it to the first parent in exchange of the food. This happened for the maximum period of three months. The first child named Lillian in this study took three weeks to actually start the intervention, this was due to the parents/caregivers who kept on making mistakes in trying to help the child to actually reach out to the picture of her desired food and to give the picture to another adult who consecutively was to give the food to the child.

Post-Intervention: After the intervention period, data was collected for a period of two weeks in order to verify if at all the child would continue to ask for the desired food using the picture. This is called reaching saturation or the saturation period.

Interviews and Focus Group discussions. In addition to the observation research, in depth interviews and focus groups were conducted with the teachers and parents/caregivers. In these sessions/interviews notes were taken by the researcher and written in text format for subsequent review. The researcher triangulated the methods by conducting in-depth focus group discussions with the parents, care givers and teachers on the use of the Picture Exchange Strategy. All the above methods were used because the techniques are used for establishing the insight and perceptions of multiple stakeholders about the issue being studied and not merely the quantities of the perceptions. As Bell (1999) asserts "Researchers adopting a qualitative perspective are more concerned with understanding individuals' perceptions of the world. They seek insight rather than statistical analysis. In addition, qualitative research is all about knowing where, when, how and under what circumstances behaviour come into being. These fit well with the present study as it was trying to find out the effects of the methodology on children with autism to help them communicate their needs.

Reliability of data collected

At least once in a week before intervention, during intervention and after intervention the volunteer home based teachers observed and checked the chart parents/caregivers were coding for inter-observer reliability. Reliability was arrived at by the volunteer teacher actually observing the child as the parents/caregivers were conducting the activity using the picture to ask for the desired food.

3.7 Data Analysis

The data gathered were entered into a record book by the parents/caregivers and the home based education teacher. These data were then reviewed by the researcher to identify any inconsistencies or problems. Once gathered data was entered into an excel file to identify trends and conduct analyses. Graphs and charts were developed to visualize the data and to find out at each stage (baseline, intervention and post-intervention) the level of support needed by the child to communicate his/her desire using the picture exchange system. The graphs and charts are able to show the child's progress in using the strategy. As for the social validity of the picture

exchange strategy data was analysed qualitatively with a lens of trying to better understand the implementation.

Data from the interviews and focus groups with the teachers and parents was reviewed by the researcher and thematically coded.

3.8 Ethical Concerns

The study protected and ensured that the dignity and welfare of all who participated as well as those who may be affected by the results of this case study by making sure that the study had no potential harm to all who participated. Besides, data collected was given a name that was not real in order to protect the identity of participants so that there would be no way to connect the name of participants to the results. Participants during the course of the study were free to withdraw from the study at any time. A written consent was sought from parents/guardians of the children that were included in the study so that later on the participants would not say they were forced to be part of the study.

Summary

In this chapter various research methods that were used are highlighted among them are qualitative methods. The rationale for employing such methods has been discussed. The chapter also analysed the importance of triangulation in research and the benefit drawn from such an approach.

The process of designing the different research instruments that were employed in this study is explained. The use of the purposive sampling procedure is explained fully. Procedures in data collection and data analysis are covered.

Ethical issues that were taken into account in this study are also discussed in detail to elaborate that this was a case study. The limitations of the study are revealed in the last section of the chapter.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.0Overview

This chapter presents the study findings including observable data that was gathered on each child for each discrete intervention trial by the use of the A,B,C chart. A summary of data across the four children is also provided. Summaries of the focus group discussions with parents and teachers are also provided. The findings generally will be presented in such a way that answers to the three objectives of this paper.

4.1 Children with autism responses to the use of picture exchange strategy for communication

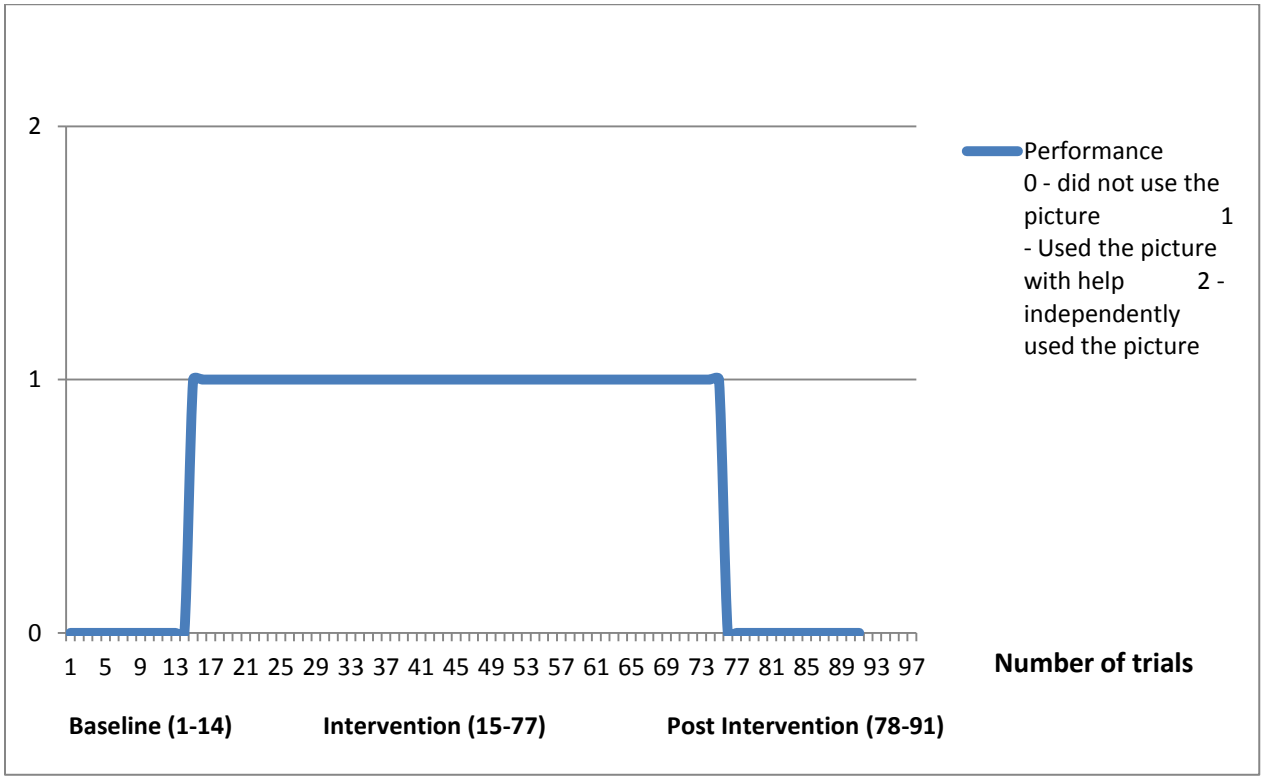
In order to demonstrate the children's responses, each child's communicative activities using the picture exchange strategy for communication were documented by the home based educators using an ABC form (a document on which the interventionist records the antecedent, behaviour and consequence when working with a child to use to PECs). The number of discrete trials and the performance of the child in using the picture exchange are identified in the tables below. The performance scale used was: 0 = did not use, 1+ used with assistance from the educator (e.g. hand –over-hand prompting, physical prompting, verbal prompting). It was imperative to document individual results because this study was a single subject design which requires data to be collected at the individual level. By reviewing each child individually one can see how well the child progressed in their performance using the picture exchange. In looking at the children collectively one can see individual differences in performance.

4.1.1 Case 1: Lilian, a girl aged eight years. Lives in Bauleni compound with her parents. Both parents do not have permanent jobs. The child exhibited concerns in her behaviour when she used to see nsima and chicken as relish, she used to throw tantrums. The teacher who was assigned to teach Lilian is trained in special education. The parents of Lilian most of the times were not found at home. It was agreed that all the children under review would be given the food once a day when the parents were home in order for them to code on the ABC chart that had already written dates. The first 14 days, the parents were to observe the child when nsima and chicken was presented. Then after 14 days the methodology of teaching the strategy was implemented. Three months and 14 days were used to teach the child the use of the picture,

followed by 31 days of observing the child on the independent use of the picture to ask for the preferred food.

As per the above explanation for Lilian, the intervention was not initially implemented correctly. The parents immediately began to use the picture exchange system instead of doing an initial observation of 14 days. When this was discovered by the researcher, the educator was instructed to begin again and start with the 14 day observation period. The initial 14 days that was incorrectly implemented is not included in figure 1 below.

Figure 1. Performance of Lillian using picture exchange to communicate preferred food.

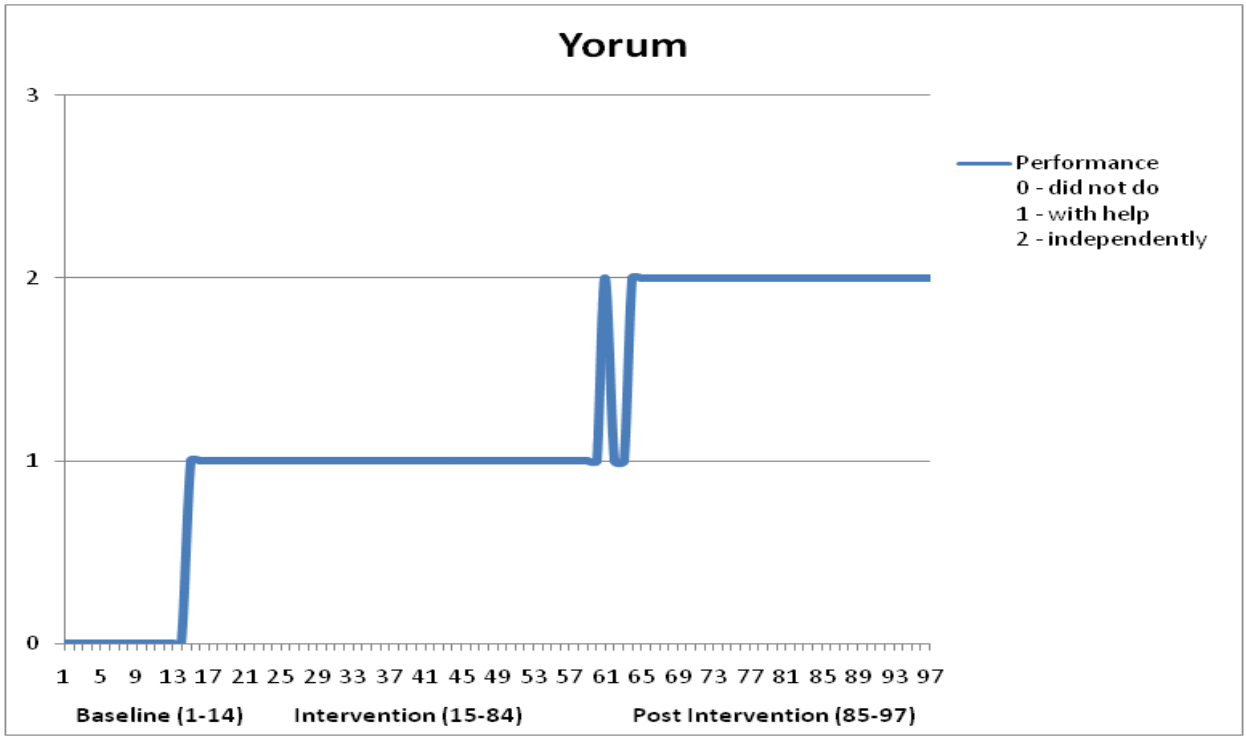


In the figure representing Lillian's response to the use of picture exchange strategy for communication (Figure 1) there are some unique occurrences. In the beginning of the implementation during baseline, the parents used the picture wrongly before intervention. Instead of simply observing the child, the educator immediately started to use the intervention. Once the researcher learned of this inappropriate start she asked the teacher to again do the baseline by simply observing the child for two weeks before starting the intervention. Thus, the child had already been exposed to the intervention which could have affected the outcomes. Once the appropriate intervention started, she used the picture largely with help and when there was no

help rendered she did not use the picture at all and she did not acquire the skill.

4.1.2 Case 2: Yorum a boy aged 9 years His parents were working and staying in Bauleni. The male teacher who was assigned to be teaching Yorum was only trained in teaching basic education classes of "normal children" It was again agreed by all parents/caregivers that the preferred food was only to be given once a day when the parents were home in order to code on the ABC chart properly. Below is the performance of Yorum using picture exchange to communicate preferred food.

Figure 2: Performance of Yorum using the picture exchange to communicate preferred food.

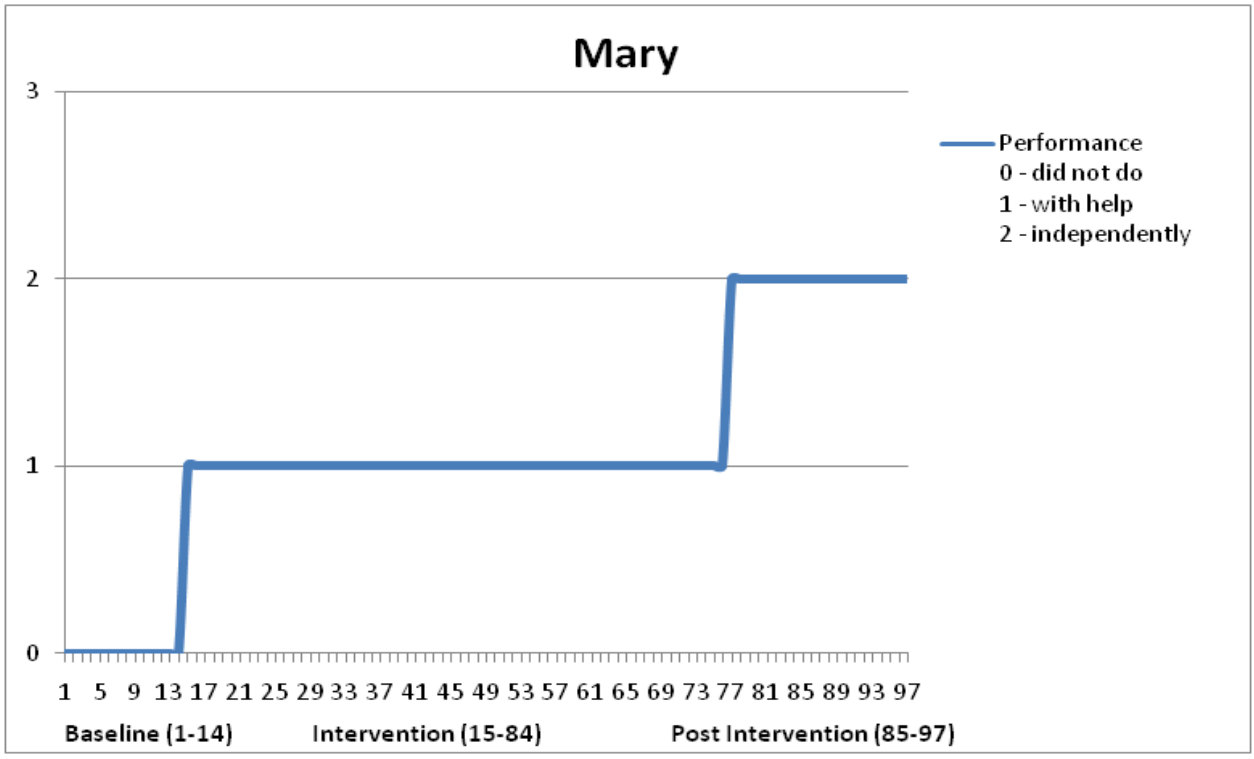


According to the responses identified in Figure 2, Yorum did not use the picture to ask for the desired food before intervention period that took a period of 14 days. During the intervention he used the picture on37 trials with help and on a few occasions after doing it independently he fell back to requiring help. He reached saturation before the end of the intervention period because he was able to use the picture independently. After intervention the intervention period concluded, he was able to continue using the picture to ask for the desired food even when the child was made to select the appropriate picture of the desired food among other pictures. During

the focus group discussion it was learnt that, when there was change of the one who was giving the child food, the child regressed using the picture and eventually used the picture independently after some time. This means that when teaching the strategy there should be mutual trust between the child and the parent/care giver. This helps the child to reach adaptation levels without regression.

4.1.3 Case 3: Mary a girl aged 10 years who initially was only able to say some words but without meaning and once in a while threw tantrum when exposed to biscuits. During the time of this study she was staying with her father as her mother had died. However there was a young lady who was looking after her. Bellow is Mary's performance using picture exchange to communicate preferred food

Figure 3: Performance of Mary using the picture exchange to communicate preferred food.



The line graph in Figure 3shows performance from Mary related to the use of the picture exchange strategy for communicating the desired food of her choice. Before intervention that took 14 trials, Mary did not use the picture to ask for the desired food. During intervention she used the picture with help79 trials and eventually learned to use the picture independently during

the same intervention period that was supposed to last for 114 days. She then continued using the picture after the intervention period independently. During the focus group discussion with teachers and parents it was learnt that the teacher/caregiver collaboration was very good. The care giver to Mary did exactly what she was taught to do and really appreciated the strategy as she said it enabled the child to at least communicate.

Therefore it can be seen from the above graph that Mary did well and continued to use the strategy without any help thereafter. In order for the strategy to yield positive results there should always be positive attitudes towards use of the strategy by both parents/care givers and teachers. This positive attitude by the adult teaching the strategy to the child help with the appropriate use of the physical and verbal and visual prompts during the intervention stage. As the child is being offered appropriate help he or she does not become frustrated and would continue doing what is expected because there is positive reinforcement which makes learning to be fun and interesting as evidenced by the outcome of the use of the picture exchange strategy.

4.1.4 Case 4: Chilufya a boy aged 8 years with severe language deficit and he used to throw tantrums whenever he used to see nsima with minced meat. He stays with his parents and both his parents work. Below is Chilufya's performance using picture exchange to communicate preferred food

Figure 4: Performance of Chilufya using the picture exchange to communicate preferred food

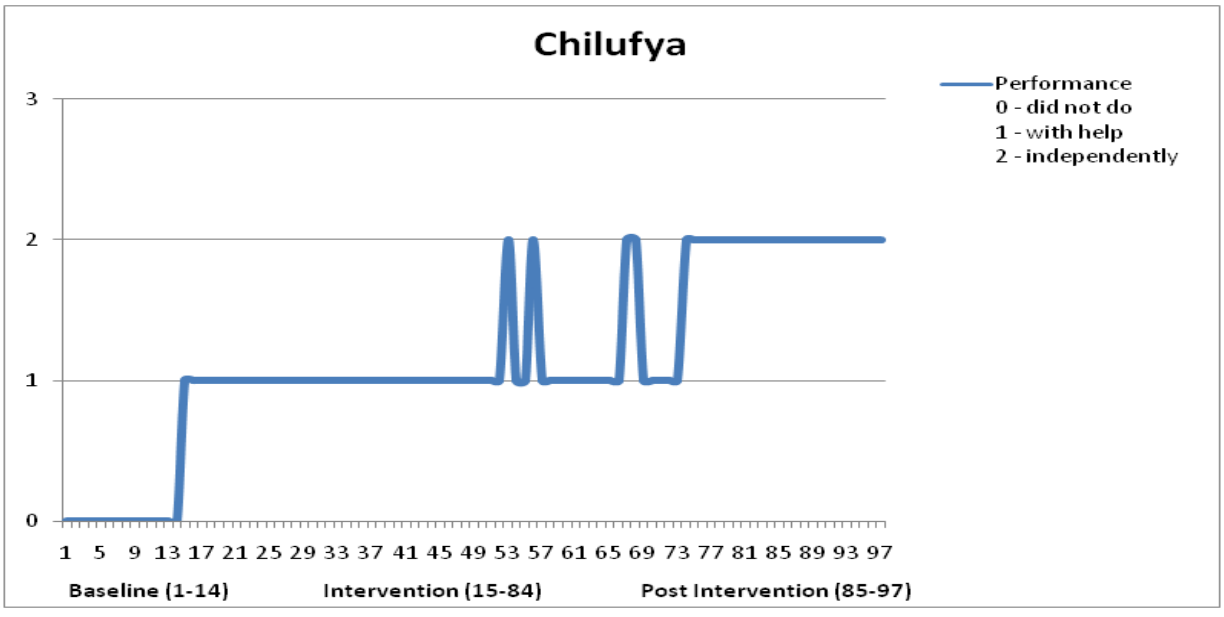


Figure 4 reveals that Chilufya did not use the picture to ask for the desired food during the 14 trials of baseline period. During intervention he was helped to use the picture to ask for the desired food up to 40 trials and it was during the same intervention period that he also learned how to use the picture independently to ask for the desired food. As indicated by the graph Chilufya had some regression after initially learning the skill independently he had to have some assistance. This was due to the fact that the caregiver who used to make sure that nsima and the minced meat was given to the child every evening he was unwell and another person came to help the child. It might be concluded that the child was disturbed with this hence the regression after the initial use of the picture independently. The lesson learnt from this is that during the intervention period, the child can master the strategy well if the same adult that child is used to presents the food in order to avoid the child getting confused. This is supported by the regression of the child when there was change of the adult that was helping him to use the strategy.

Another important consideration is how the children learned differently and showed different patterns of skill acquisition and performance. Not all of the children were able to maintain the skill after their first independent use of the picture exchange. Two children Chilufya and Yorum had some regression requiring assistance from the educator more than one time after their first independent use. Mary maintained her independence after the first time demonstrated it and Lillian never reached independence (likely due to fidelity of implementation of the intervention by the educator and parent/caregivers as identified in the family/caregiver and teacher interviews and focus group discussion).

Figure 5: Combined picture exchange performance responses at each level across children

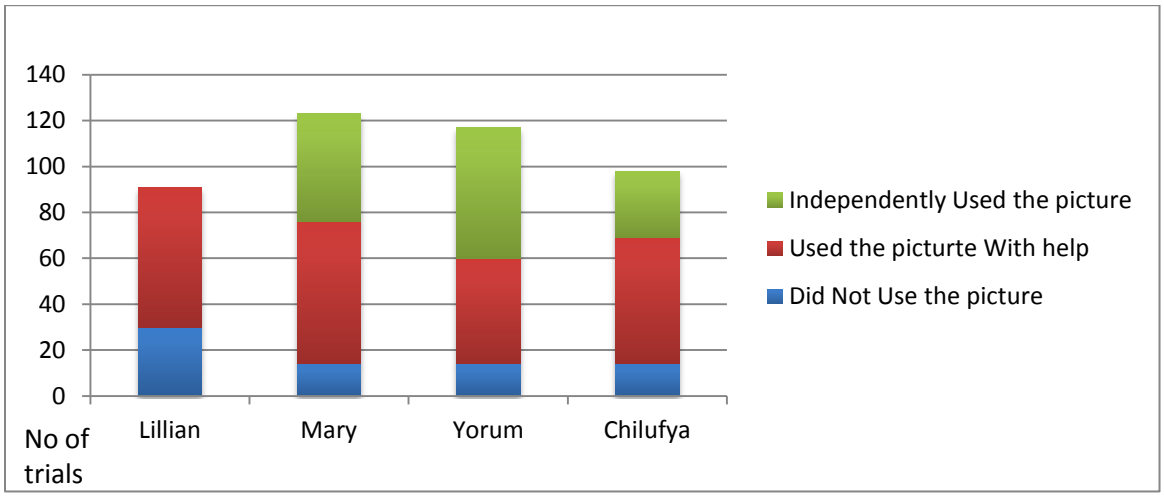


Figure 5 identifies the number of times each child had each performance level (did not do, with help or independent). As can be seen in this figure, the children required different numbers of trials using the picture exchange before they were able to obtain the skill. Lillian did not manage to use the picture for communication. According to the data gathered during the focus group discussion it clearly shows that the parents to Lillian were not interested in using the strategy as it was reported that people from the community laughed at the child and that they thought it was a waste of time. In this case it is evident that the parents/caregivers who were interested and collaborated well with the teachers their children learnt to use the picture for communication. It should be noted that the above graph shows that two of the children regressed before reaching saturation. This was due to various reasons ranging from the substitution of the care giver, negative utterances by those who were helping the child, not following the methodology of teaching the strategy, not having enough time to implement the strategy and generally negative attitude by the family members which had an effect on the child to reach mastery of the skill. This shows that in order for the strategy to work properly, particular people should be assigned to teach the child so that there is no omission of the important steps in implementing the strategy. In conclusion 3 out of the 4 children learnt the skill and after intervention the children continued using the picture, meaning they reached saturation of the skill.

4.2 Teachers 'responses on the usefulness of picture exchange for communication in teaching children with autism

In order to triangulate the results collected on the four autistic children the researcher conducted a focus group discussion with four teachers. The four teachers were fully involved in the initial

teaching of the four children under review. During the focus group discussion, questions were asked about teacher knowledge related to autism, opinion about the use of the picture exchange system, teacher training, the actual implementation fidelity of the intervention and thoughts on parent/caregiver attitudes about using picture exchange to teach children in their home.

4.2.1 Teachers' responses on how they knew that the children respondents were autistic

The teachers were asked to explain on how they knew that the child they were teaching had autism. Their response was that all of them had used the Diagnostic and statistical manual of Mental Disorders Diagnostic criteria for Autistic Disorders (2006) to identify the children and besides that they also used the Autism screening Modified checklist for autism in toddles (MCHART) down loaded (on 10th January 2012) from M-CHAT.ORG. For instance teacher "A" explained that "*you know sometimes it is difficult to know that this child is autistic but we were taught at the beginning of this study on how to diagnose a child who is suspected to be autistic".* Teacher "A" went further and said *Vana vambiri mukomboni vari autistic koma makolo sibaziba koma ifetisebedzesa diagnostic manual kuti tibazibe.* (Many children in the compound are autistic but most parents do not know that they have autism. In our case we use the diagnostic manual to diagnose them).

4.2.2 Teacher responses on the type of picture exchange used for teaching

Teachers were asked to explain the type of picture exchange strategy they could have used when teaching children with autism. They all said it was a way of enabling children with autism to communicate by showing pictures of what they want to communicate. They also said it was a way of talking. In the course of the focus group discussion teacher "C" strongly argued that " *Iyi ndinjira yabwino yontandiziramo vana vari autistic kusevedzesa pictures kutivachite communicate namudzawo kapenamakolo avo*"(This is a way to help children that are autistic to communicate within themselves or their parents).

Regarding the use of the picture exchange before the study, all the teachers indicated that pictures were only used in order to show what they wanted the children to see but not for communication and that they did not know the strategy it was the first time to hear of such a way of using pictures. In relation to the statement above, *teacher "D" indicated that, "though the method was somewhat good, I am still learning how to use it and to further appreciate the communication levels on my learner with autism."*

4.2.3 Teacher training in the usage of picture exchange for communication in teaching.

Teachers were asked to explain the training they underwent regarding the use of the picture exchange for communication. All teachers said that they were actually trained before they started teaching the children to use the strategy. The teachers clarified that the training they received was basically arranged by the researcher. They did not learn the skill from other institutions of learning. Teacher "A" said that *"I have gone to a teacher training college but I had never learnt of this strategy. The first time I heard of it was during this study. I even asked from other teachers they did not have an idea."*

4.2.4 Teachers' responses on the monitoring of the coding of information during the research period

Another issue that was discussed during the focus group was how the teachers were monitoring the coding of the data by parents/caregivers on the ABC chart. That is if, at all they were able to visit the homes of the children to actually verify if at all the coding by parents/care givers was done properly. The responses varied with three teachers who said "yes" agreed that they did manage to visit the children to verify what was happening. Teacher "D" explained that it was difficult to verify what was happening because in most cases no adult was found at home most of the times and could not find the coded ABC chart for verification. Teachers "A", "B", and "C" who had the opportunity to observe the child's behaviour regarding the use of the picture exchange strategy mentioned that before intervention the children were either crying or grabbing their desired food. During intervention the children started reducing the inappropriate behaviours and when they learnt how to use the pictures to ask for their desired food they completely stopped using inappropriate behaviours to ask for the food. It was observed by teachers "A" and "B" that out of the four children two children had also learnt how to say single words that they had never said before.

4.2.5 Teachers' responses on parental attitudes on the usage of picture exchange for communication

As regards to the parental attitude the teachers explained that four of the parents who were working did find a suitable adult to help them to carry out the instructions from the teachers. They also taught the same adults what they were expected to do with the pictures while teacher

"D" explained that parental attitude was actually bad in the sense that they did not want their child to use the strategy complaining that where on earth can someone talk using pictures. In his words teacher "D" said you need to understand that some parents are not willing to accept that their children have a disability so they try to frustrate efforts indeed to help such children because they consider such effort as a bother.

The teachers also explained on the coding of the ABC chart that parents were able to code on the chart because it was easy. It only required a mark that was easy to draw. The teacher said "*Makolo amwana wamene niyendela anali kulemba pachipepala nishi inenilipo ena. analibafeki"*(Meaning that the parent of a child coded the sheet in the presence of the teacher and this means that the coding was not done according to what they had observed the child doing.)

4.2.6 Teachers' responses on how long they used the picture exchange method to communicate with children with autism

Teachers were also asked for how long they used the pictures that were initially made for pupils to use during the study. Teacher "A" answered that "I used the picture exchange method for the selected children with autism for a period of five months during which the research was on-going". Nevertheless, three of the teachers indicated that though the research period had elapsed, they found the communication method to be very effective. For this reason, these teachers had continued using the picture exchange method for communication. Two of the teachers also said that they did not just use the picture exchange method on the respondents only. Rather, they extended the idea to other children with autism. The two teachers confirmed that as far as they were concerned, the strategy was very helpful. This was so because the children even started using the picture in order to choose between food items that were presented to them.

4.2.7 Challenges experienced by teachers in the usage of picture exchange strategy for communication in teaching children with autism

The teachers were asked to explain the challenges they encountered during the study period in the usage of the picture exchange strategy. They said that the strategy being new in Zambia needed a lot of time for all involved to adjust and implement it to the best of their knowledge. They all said that it needed all involved to be committed. For example teacher "A" presented that

the main challenge was the unavailability of parents during the monitoring period. In fact teacher "D" said that "*benango sibenze kuti landira bwino".* On the other hand teacher "C" said that "*though they were many challenges the parents I dealt with were very supportive. However it always requires commitment for all involved*."

4.2.8. Teachers' responses on the usability of the picture exchange for communication in teaching children with autism in Zambia

When asked if the picture exchange strategy can be used to teach children with autism in Zambia, teacher "A", "B" and "C, said that the strategy does not use expensive materials and that it can be used any where even in villages because of the availability of pieces of paper to draw the pictures. *Teacher "B" said" according to me the pictures are easily understood by all the people. It does not need people who are well educated."* Three of the teachers said that most of the children's problem behaviours had reduced and were enjoying using the picture to ask for the desired food.

4.3.0 Responses from the parents/caregivers regarding the picture exchange strategy

Another focus group discussion was conducted with parents/caregivers of children who were in the study to try to establish whether picture exchange strategy could be a socially accepted communication teaching method for parents to use in their homes. A guide to the discussion was used (see appendix). Questions focused on parental knowledge of autism, the use of the picture exchange system and community attitude about their child using a picture exchange system to communicate.

4.3.1 Parents responses on how they knew that their child had autism

With regards to how the parents knew if their child had autism, half of the parents mentioned that they did not know about it until when the teachers started telling them of what they had observed on the child and later on the teachers had to administer the checklist of behaviours together with the MCHAT. The results obtained from using both tools showed that their child had autism. However all the parents said that they did not know that their children had autism. They said that these teachers are the ones that came to inform them. All they knew was that their children were "mentallysick". *'Sindinadziwe kuti uyu mwana ndilinaye ali ndimatenda. Omwe awa adziphunzitsi ndiwo omwe anandiudza. Ndinali kumangoganidza dzakuti mwana uyu anali*

wosokonedzeka. ("I did not know that my child had autism. The teacher is the one who told me as I was thinking that my child was mentally sick").

4.3.2 Parents responses on what they knew concerning the picture exchange and if they had used it before for teaching

To find out if the parents knew the picture exchange strategy and if they had used it before the discussion focused on this topic. All the parents/care givers said that it was a way of helping their children to talk and they all mentioned that they had not used the strategy before and they had never heard of it before. To this effect, one parent said: "*Sindinanverepo ayi dzauphunsitsi wotele ndipo sindinawuwonepo kulikonse."* ("I had never heard of such a strategy of teaching communication and i have never seen any person using such type of communication").

4.3.3 Parents responses on what other family members' reactions were upon learning the strategy

To find out the reaction from other family members/caregivers upon learning the strategy, most of the parents said that they had to do a lot of explanation of what was happening to the child. It was only after the explanations that the family members supported the use of the strategy especially when the child's aggressive behaviours started changing. Only one parent said that the strategy was never accepted and the family members thought it was wasting time to teach a child who they had failed to teach for many years.

'Uphundzitsi wotele siungathekuthandidza mwana uyu ndipho achibale anati uli
Kuwataisa nthawi kwambili chifukwa anthu ambili adakangiwa kuphundzitsa mwana uyu pa zaka-zambili.

("Teaching a child in this way is a waste of time. We have tried as parents to teach for many years but nothing has been achieved to me I think it's a waste of time.")

4.3.4 Parents responses on community attitude upon seeing the children using the strategy

Regarding the community's attitude upon seeing their children using the pictures to ask for the desired food, the parents mentioned that it was not a problem as they were explaining to whoever was surprised with what was going on. Most of them even received help from the neighbours during the implementation stage of the study.

*'Anthu ambili ali kundiseka ndizomwe ndinali kuchita naye mwana uyu. Anati ali kuchita zopanda nzelu ndimwana wawo awa amai.(*A lot of people were laughing when they saw what I was doing with my child. They said I was teaching a child something that did not make sense).

4.3.5 Parents responses on the durability of the pictures that were used

Regarding the pictures that were used during the study the parents said that they were still in good condition and would be used for a longer period of time. However one parent mentioned that they needed to be mounted on a bigger piece of paper as the small cards were difficult for a child to locate once they are out of reach.

'Izi zithunzi-tunzi, dziyenela kuikidwa pachipepala chachikulu kuti zitsasowe ayi'

("These pictures need to be mounted on a bigger piece of paper because small cards get misplaced easily as it once happened to my child")

4.3.6 Parents responses regarding the challenges they faced when using the strategy

During the study the parents/caregivers generally said that there were not a lot of notable challenges, but they mentioned that the beginning of the strategy is a bit difficult for working parents to implement because all the time an adult needs to be with the child as the strategy is being introduced to the child. Only one parent mentioned that the biggest challenge that the family faced was that the child did not learn anything because the child did not like doing the activity.

'Bvuto yomwe ndinaona poyamba inali yakuti mwana sanafune kuchita nchito ija ndinayamba naye.'

("The problem that I noticed was that the child initially did not want to do what she was asked to do.")

4.3.7 Parents responses on whether or not the strategy could be used in the Zambian context

As to whether the picture exchange strategy was accepted by all the people that the child interacts with as a means of communication according to the experiences they had during the study parents said the following:

Most of the people who interacted with the child as they were using the strategy said that at least the children would be able to ask for the food they wanted."*Chawama mwana uyu azambo tiuza chamene afuna kudya. Kale anali kulila chabe. Mwaona aleka zonseizi. Mwe! Mulungu aliko."* (Meaning "It is good that this child will be telling us what she wants to eat. Before, she used to cry only. Nowadays she has stopped crying. You people God is there)."Some people said that the children had changed for the better in terms of behaviour and asked the parents to which school the child had started attending.*"Uyu mwana asithika. Nanga amayenda kusukulu kuti masiku ano? Ndipo vamukwanisa"* (Meaning, "This child has changed. Which school has the child started attending? They have managed to teach this child)"Some children in the community had started playing with their children so as to have a chance of seeing the card and to help the child by giving them the desired food on the pictures. This meant improved socialisation of the child with autism. Other people observed that most of the children who were part of the study had also started mentioning verbally the food that was on the picture. This means that the vocabulary to some children improved. *"Mwevanthu Chilufya anayamba kukambako masiku ano. Ma picture amene aja asevedza"* (Meaning you people Chilufya has started talking. Those pictures are working)"One parent said that people in the community were difficult and that they would laugh at the child because it is not a normal way of communicating."*Imwe vanthu ndi vobvuta ine mwana wanga vanari kumuseka, ndizoona kulibe muthu angakambe ndizi picture".*(Meaning, "People are difficult, my child was being laughed at. It is true that there is no one who can communicate using a picture".

Summary

The Chapter presented findings from observable data gathered from each child before intervention, during intervention and after intervention showing the number of discrete trials and performance. The same individual data across children was also presented in a graph form in order to show how each child had performed at each level of intervention.

The focus group discussion for both teachers and parents was also used in order to verify the effectiveness of the strategy to children with autism.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 OVERVIEW

This chapter provides a discussion based on the findings of this study. The study investigated the effects of picture exchange on the communication skills of autistic children. Specifically, the study strove to determine if children with autism could use the picture exchange strategy for communication. Since the strategy is being used in Zambia for the first time the study also tried to establish if teachers would find picture exchange useful in teaching children with autism and if at all picture exchange is a socially accepted communication teaching method for parents to use in their homes.

5.1 Children with autism responses to the use of picture exchange strategy for communication.

The data from figure 1, shows that the child did not learn how to use the picture to ask for the desired food at the end of the intervention period nor was she using it in the post-intervention. After intervention she still did not use the picture at all. These results are supported by Fullan (1991) who stated that the closer the parents to the education of the child, the greater the impact on child development and education achievement. This means that partnership between families and professionals will in this sense, increase strong links and sustain consistency in the teaching programme that will result in a holistic approach and reduce misunderstandings, confusions or adoption of approaches that are not helpful to a child. Considering the discussion above it is evident that Lilian did not receive adequate support from the parents. For all individuals with autism one key feature that determines their disability is lack of attachment (Body 1994). Owing to this inadequate support given by the parents/caregivers it can be justified that Lilian failed to use the picture exchange for communication. The initial intention of the study was to ensure adequate provision of the picture exchange support by the parents/caregivers. For this reason it can be concluded that if a child with autism is not adequately supported during the picture exchange communication training, it may be difficult to acquire the skill.

Figures 3, 4 and 5 respectively illustrate the data for Yorum, Mary and Chilufya's performance across all three phases: baseline, during intervention and post-intervention. All the three

participants did not use the picture to ask for their desired food before intervention. During intervention all the three used the picture with help. Before the end of the intervention period all the three managed to use the pictures to ask for the desired food without help. The use of the pictures to ask for the desired food continued after intervention to all the three children. The results are fully supported by Skinner's (1975) Applied Behavioural Analysis (ABA) approach used in which prompts were given to guide the picture exchange. It also used positive reinforcement that encourages desired behaviours supported by errorless learning.

One significant achievement of the study was that within the intervention period all the three children had learnt to use the strategy. It can be deduced that despite the different levels of cognitive performance of the learners, they were able to grasp the picture exchange communication system. This was a remarkable progress among individuals with autism. Rudy (2012) indicated that while individuals with hearing impairments may present difficulties with speech one can still communicate with them using sign language. In contrast individuals with autism have a peculiar display of behaviour. One cannot use sign language or verbal language to get hold of their attention. To this effect, if the three out of four learners under review were able to capture, use and interpret the meaning of each picture given to them in the shortest period possible, then it should be a great achievement in the Zambian situation.

The findings seem to suggest that learners with autism can easily use picture exchange method as a way of communication. Besides this demonstration, the fact that all the learners that were purposively selected with varying experiences and backgrounds, learnt picture use, is an indication that the strategy could also be used by other learners with autism. To some greater extent, it was justifiable for Frosty (2006) to argue that pictures are a universal language. The interpretations of pictures cannot vary as a result of cultural influence or any other factor. Therefore, it can be concluded that since the Zambian individuals with autism learned to communicate using pictures, it can mean that, picture exchange language can likely benefit autistic individuals in Zambia.

From the discussion above it seems that the pace for the picture exchange strategy acquisition skill largely depends on care giver support attachment and commitment rather than age and the mere presence of a care giver. It is evident that despite the varying experiences of the three autistic children above, they were all able to acquire the communicative skill. This represents a 100% success in situations where correct methodological approaches are used to train the autistic

child. For instance, the study demonstrated that the communicative results show that in instances where the child received adequate parental commitment, the objectives were met with adequate success.

5.2The usefulness of picture exchange for communication in teaching children with autism

It is evident from the findings of the focus group discussion held with teachers that participated in the study, that the picture exchange for communication in teaching children with autism is useful. This is so because of the several observations, results and findings emanating from the experiment case study. For instance, the strategy had helped the three children with autism to communicate in social activities. *Vana batu vankala bwino manje. Vasevera nava nzawo.* (Meaning "our children are now better and can socialise with friends)". Since teachers were involved in data collection, it was easy for them to deduce that the individuals under review could also use the same approach in class. Bondy (1987: page 55) remarked that since many people on the autism spectrum tend to learn visually, it makes good sense to communicate with images. Just as important, images are a universal means of communication and they are just as understandable by strangers or young peers as by parents or therapist.

To this effect, teachers can take advantage of the ability to see by most of such children in order to teach them different skills in class.

One of the teachers said *"I have leant a lot during this study. I can use the same strategy at school to reach out to the children with autism because before this I used to think that such children are mad". Another teacher also said that "Just a drawing on a piece of paper did all the magic of transforming the life of a child who could not be understood by people".* In fact, in several experiments conducted by different individuals and corporations, it was concluded that "Much more significant to the picture exchange strategy philosophy is not the specific picture cards or their holders, but rather the process by which non-verbal children (and adults) are taught to use these cards, over time, claim the makers of the picture exchange strategy (and their claims are backed by experience and research). Children who use the strategy build independent communication skills. At the same time, apparently as a by-product, many children also gain significant spoken language" (Autism Association of America, 2011). Three of the parents said *"Vana vantu vana yamba kukamba mazina yachakudya chamene vakonda" (*Meaning two of the children have learnt to say the names of their preferred food.)

Several reviews conducted by Bondy and Frost (2001) have found that the use of the picture exchange strategy does not impede the development of speech in individuals with autism and in fact may result in individuals acquiring spoken language. They hypothesized that using picture exchange strategy to help children with autism to communicate relieves the pressure of having to speak, allowing the individual to focus on communication, and that the reduction in psychological stress makes speech production easier. Though this study did not manage to get adequate and convincing spoken language from the respondents with autism, it was evident that with the continued use of the strategy, learners would improve greatly and probably reach a level where communication would become fluent and perhaps signs of language speaking emerging from the activities. Of course, to confirm the presentation by these researchers, in the case of this study, some children who had learned how to use the strategy even started mentioning the names of the food that was drawn on the pictures, meaning some verbal language also developed. The study shows that 3 out of 4 parents provided such information and only one parent did not agree with the other parents. She mentioned that the community members were laughing at her child when she tried to use the pictures. Apparently that was the only child who did not master the use of the strategy.

The study demonstrated that the picture exchange strategy was user friendly because all the teachers categorically commended the system. In fact, according to the teachers, the strategy helped them understand the learners with autism. The researcher observed that teachers who appreciated this strategy were the ones who were trained before the beginning of the study. When time came to implement the strategy, it was easy to apply the idea. It seems therefore that in order for teachers to perform the required teaching, they need an intensive training in the usage of the picture exchange strategy. This assertion is confirmed by all educators that advocate for the training of teachers. For instance, UNESCO (2013), presented that in order to implement new programmes in schools or to individuals, training of teachers would be paramount. Certainly, the approach provides significant confidence among teachers. Apart from the information given above, teachers also commented that the strategy had helped three of the four children to reduce the behaviour of crying or grabbing food. One of the teachers said *"The child I was visiting even stopped to cry whenever food was presented to him, when he learnt to hand over the picture to the parent".* This was a remarkable realization; Rudy (2012) observed that most of the autistic individuals do not seek social willingness by the parents, caregivers and the

community to support the welfare of autistic children. It would also be concluded that the strategy had helped children to acquire good behaviour that made the community accept the strategy more and more.

One other important observation made from this study was that the children that were using the strategy were socially accepted by other children as they wanted to be the ones to give the desired food to the children who were using the strategy. In most of the communities, people would like to be associated with what looks like a new development. In reality, the picture exchange strategy is relatively a new system of communication in Zambia which generated a lot of interest among children with autism, parents of the said children and the general community. The social acceptance was overwhelming with 3 parents out of4 showing a sense of relief as a result of using picture exchange for their children. The approach was an alternative method for them. One of the parents said *"Ine mwana wanga anakhala navadzake chifukwa chofuna kuona picture yamwana ndikasevedzedwe kake. Masiku ano adzake vamwana wanga varibwe."* (Meaning *"My* child has now got friends who initially wanted to find out how we were using the picture. Nowadays my child has a lot of friends.")

The above results clearly indicate that, the intervention led to very positive changes in a child that were targeted by the intervention program. The parents mentioned of some children that were able to say some words and that had never happened before. The three children who learned how to use the pictures for communication acquired good behaviour that made them to socialise with others. The significant change may be attributed to increased communication skills which play a critical role in the development of socialization skills. Finnegan et al. (1987), Bondy and Frost (1998) have documented the positive contribution of the picture exchange strategy to help with behaviour management in individuals with autism. This means that the strategy also helps in decreasing the stereotypical behaviours of these children. The study revealed that the strategy gave an opportunity to the individuals with autism to be able to speak out their feelings with less difficulty. Their ability to speak was heavily dependent on the usage of pictures.

In a description made by the Autistic Association of America (2011), it was indicated that the strategy would easily be used by any individual with little sense of creativity. To a greater extent, all teachers admitted that the strategy does not use expensive materials. It can be used in urban,

peri urban and rural settings. In fact, according to Rudy and Bondy (2009), any caregiver working or living with autistic individuals may use a collection of different pictures from newspaper cuttings, photos, drawings, artistic work and colourful decorations on a piece. All forms of pictures can be used to help a child with autism to communicate.

5.3 Socialacceptance of the picture exchange communication system by parents and teachers

As indicated by responses from the parents' focus group discussion, three parents out of four clearly indicated throughout the discussion that the strategy was a socially accepted communication teaching strategy for them to use in their homes because of a number of reasons. For instance, the three out of four children learned to ask for their desired food even when at first it was difficult for the family members to understand what was to happen as the strategy was not well known to them. In this study, the discussion by parents revealed that the said autistic children learned to ask for food with the picture exchange approach. One of the parents said *"sitinali kudziwa zocita ndimwana uyu sopamene tinaona tandizo iyi tinayesayesa kupudzisa mwana. Ndipo tinalikuuza vanthu chomwe tinali kucita ndimwana. Panalibe anaseka ayi. Vonse vamene tinali kuuza anali kukodwela nazo." (*Meaning "I didn't know what to do with my child, so when this help came to being, I accepted it fully and I took it upon myself to educate my neighbours who were also happy that the child was being attended to "). This confirms the observation by Frost (1998) who showed that when any activity is generally accepted by the community and the society, it is easier to implement. In fact, many scholars demonstrated that when picture exchange is accepted among individuals with autism, they can use it as dependable language. In this study, autistic children showed masterly of the picture exchange and ability to communicate with the relatives with less difficulty. Ultimately, this demonstrated that if a child with autism is given such training, he may consequently develop good communication skills. During the experimental activities, the strategy was also accepted by the community after the parents had explained the use of the strategy. Some members of the community also helped during the intervention stage. Frost (2003) argued that when children with autism are provided with support and the materials to be used, they can do better. Community support or help is crucial in such activities. As Brofenbrenner (1979) explained most children with disabilities suffer difficulties because the community does not understand how the learners operate. Brofenfrenner (Ibid) argued that the community forms layers of understanding issues.

The micro system deals with the child and the immediate members of the family. The meso system deals with neighbours, school, friends, and workmates and so on. The third layer involves media and educational services. Finally, the macro system concerns the entire larger society like a nation. This theory is very important in the understanding of the picture exchange programme for the community.

The researcher noticed an interesting phenomenon during the study period. Of the three children who managed to master and use the strategy, it was noticed that some members of the community used to help the children whenever the parents to the children were not there or were busy with other house chores. The involvement of the members of the community in assisting the children demonstrates a desire to understand and appreciate the challenges experienced by the learners with disabilities; certainly, the involvement of the community signifies a transformation of the society. The transformation of the society was attributed to the way Home Based education programme (2002) is conducted. Where the programme is functional it aims at sensitizing the community on the possible cause of disabilities so that the community understands that the conditions presented by the different children are not due to supernatural beliefs. Most people do not want their children to be associated with disabled children for fear that disability is infectious. They also believe that children especially with autism are mentally sick and they should be hospitalised. Before the programme most people were still under the medical model of viewing disability as sickness but now through the programme they have understood and have moved to the social model whereby they are even able to help a child with autism to communicate. In fact, it means that the behaviour portrayed by the community was an outburst of attitudinal change. The attitudinal change is important if disability has to be accepted in society.

The pictures used were laminated, meaning that they were good enough to be used for a longer period of time and at the end of the study, they were still found to be in good condition. The researcher observed that the teachers would not spend most of their time making the pictures once they were properly made. The fact that the strategy helped the three children with autism to communicate their needs made the strategy to be socially accepted. In addition the strategy had also helped children to acquire good behaviour that made the community accept the strategy more and more.

The study further revealed that children who were using the strategy were socially accepted by other children as they wanted to be the ones to give the desired food to the children who were using the strategy. In most of the communities, people would like to be associated with what looks like a new development. And, in reality, the strategy is relatively a new system of communication in Zambia which generated a lot of interest among children with autism, parents of the said children and the general community. The social acceptance was overwhelming with 3 out of the four parents showing a sense of relief as a result of using picture exchange for their children. The approach was an alternative method for them.

The above results clearly indicate that, the entire intervention led to very positive changes in a child that were not targeted by the intervention program. The parents mentioned of some children that were able to say some words which had never happened before. The three children who had learnt how to use the pictures for communication had acquired good behaviour that made them to socialise with others. The significant change may be attributed to increased communication skills which play a critical role in the development of socialization skills. Finnegan et al. (1987), Bondy and Frost (1998) have documented the positive contribution of the picture exchange strategy to help with behaviour management in individuals with autism. This means that the strategy also helps in decreasing the stereotypical behaviours of these children**.**

In addition, the fact that among the three children, some learnt how to vocalise some words leads to the conclusion that the particular intervention program, although it does not directly target verbal language, encourages its acquisition. This came about because of using pictures for communication.

From the discussions made above, it is evident that the picture exchange strategy could be an appropriate way of promoting generalization of different skills that a child with autism needs, as the strategy demands the child to repeat the activity over a period of time. For the children in this study the next steps would include teaching them to choose between two or more food items then progressing on to additional areas in which children need to communicate preferences such as routines, activities, people, etc. This means that the child passes through the necessary stages needed for the child to learn and use the skill independently in all settings. According to the Zambia Home Based Education Programme (2000), a child needs to pass through the acquisition, fluency, maintenance, generalisation and adaptation stages in learning a new skill.

Since Overall, the findings of this study are consistent with the findings of other researchers such as Bondy and Frost (1994), the writer supports the above implication because the picture exchange strategy has been of benefit to children with autism at Bauleni Special School and the community, and, addresses the most challenging problems that Zambian teachers face as they try to educate such children.

5.4 Challenges encountered during intervention of the strategy

The focus group discussion also highlighted the challenges encountered by parents and teachers in implementing the picture exchange strategy. During the discussion all the parents mentioned that they did not know that their children had autism, they thought that their children were mentally sick. This meant that there was no effort put to enable their children to communicate as they did not understand the condition. All the parents also said " *Sitinali kuziba kuti muthu angakambe ndizitudzitudzi"* Meaning, we did not know that a person can communicate with a picture. Three of the parents said,"*Tinangolimbikila koma citenga tawi kuti mwana apudzire. Siapa vantu vanakoza."* Meaning the intervention is time consuming as it requires one to one attention for effective implementation but at the end our children managed to communicate. One of the parents said that "*Ine aticha sanaikeko dzeru ndiponso mwana wanga vanalikumuseka vanthu".*Meaning there was no collaboration between a parent and a teacher and that other people were laughing at my child.

Summary

The chapter was concerned with the discussion of findings of the effectiveness of the picture exchange strategy to children with autism to help them to communicate their desired foods. The chapter starts with the case study observations of the four children and highlights the effectiveness of the strategy to children with autism. The views by teachers and parents that were gathered through the focus group discussions also indicated the strategy's effectiveness. The chapter ends up by concluding that the findings of the study are in line with other researchers who conducted similar studies.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter provides a summary of the study, conclusion and recommendations.

6.2 Summary

The study has shown that picture exchange strategy can be used to help children with autism communicate. In particular, the four Zambian children with autism in the study three out of four benefited from the use of the strategy. As the child acquires the necessary communication skills it can result in the acquisition of verbal language for some children. The effectiveness of the strategy demands full participation of parents/care givers as they have to prompt and reinforce the use of the picture for a child to use it for communication. The strategy, when properly used, can be accepted by the general community as a way of communication and even encourages a child to communicate that way.

The study has also demonstrated that the strategy is cost effective and therefore can be used in rural, peri-urban and urban settings because it does not need expensive materials to implement. The pictures can be made from old calendars and card boxes that can be found even in the villages where there are no big shops throughout Zambia.

6.3 Conclusion

The results of this study suggest that the picture exchange strategy is effective in helping children with autism initiate communication. Additionally, as the children use the strategy some may also learn verbal language and reduce unwanted behaviours.

6.4 Recommendations

The research has addressed the original aim set out for this study. From this discussion it is possible to make some recommendations for future policy, practice and research based on the results.

(a). Teacher Training Colleges and Institutions of Higher Learning:

(i) Must include Augmentative and Alternative communication in the teacher training curriculum. This training should include the use of the picture exchange systems to facilitate communication as well as implementation of ABC assessment and documentation.

(ii) They must design courses on the methodologies of teaching special education and regular education teachers about specific disabilities such as autism. Included in this training should be basic information on assessment and treatment to improve socialization, communication and behaviour.

(b) The Government through the Ministry of Education, Health and Community development must:

(i) enable Line Ministries to collaborate in conducting early identification and intervention strategies for children with autism to improve the acquisition of effective communication at a younger age.

(ii) provide a clear policy on the education provision of learners with autism in the Zambia.

(c) Parents to:

(i) collaborate with teachers in order to come up with intervention programmes that receive positive reinforcements in all environments.

(ii) receive training about various types of disabilities, including autism, and effective strategies they can use at home to improve socialization, communication and behaviour.

6.5 Future Research

In future, it may be important to do the following research:

(i) To expand the researches to further explore the influence of caregivers on the intervention of the communication of children with autism. Increasing sample sizes and focusing on various parent/caregiver interventions might provide further insight into the importance of families/caregivers in implementation and fidelity of interventions of this nature.

(ii)To expand research to include more broadly studies that look at the effect of token reinforces on developing communication deficits of children with autism and comparing various types of programs to see if some are more effective in compounds and village life for these children.

(ii) Further research is needed to replicate the findings of this study, to expand on additional environmental factors that are associated with communication functions, social interactions and positive support of children with autism. It will be important, to increase sample size and to offer a wider array of picture exchanges so that learners can discriminate between more than one picture.

REFERENCES

American Psychiatirc Association, (2013)*Diagnostic Statistical Manual of Mental Disorders, Text Revision 5th ed.*Washington District Colubia.

Adkins T. And Axelrod S. (2000).*Comparing the Picture Exchange Communication System and Sign Language Training for Children with Autism.* Michigan: Gale groups.

Baird, G. (2003). "Diagnosis of autism": *American Journal of autism. 18th edition.*

Bell, J. (1999) *Doing your research project: A guide for first time researchers in education and social sciences.* Buckingham: Open University press.

Berkubger, L.T. & Smith T.H."Review of Sub typing in Autism and Proposed Dimensional Classification Model," *Autism and Developmental Disorder 11.4.*

Bondy, A. And Frost L. (1994). *The Picture Exchange Communication System Training Mannual.*New York: Pyramid products.

Brower, F. (2007).*Supporting Pupils of Autistic Spectrum*.Hampshore: Colour press.

Cafiero, J. (2005). *Meaningful Exchanges of People with autism*. Bethesda: M.D. Woodbine house.

Federal Government Department (2007).*Centre for Diseases Control and Prevention. Washington.*

Frost, L. (2000). *The Picture Exchange Communication System Focus on Communicative Behaviours.* Michigan: Gale groups.

Ganz, J. & Simpson, R. (2004). Effects on communicative requesting and speech development of the picture exchange communication system in children with characteristics of autism. *Journal of Autism and Development Disorders, 34.*

Gotham,C. (2008)*Classification of autism spectrum disorder.* University of Oxford.

Haddock, P. (1975).*The Concise English Dictionary.* London: Brookes.

Howlin, P. and Gordon R.K. (2007) *The Effectiveness of Picture Exchange Communication System: Training for Teachers of children with Autism.* New York: University press.

Kanner, L. (1971), Follow- up of 11 children originally reported in 1943. *Journal of Autism and Childhood Schzophrenia.*

Kazdin, A. E. (1989), *Behaviour modification in applied settings.* Pacific Grove, CA Brooks.

Kendra, S. (2013) A*utism Laboratory for development of communication skills and social Behaviour*.Greece.

Kolvin, I. (1999) "*Studies in the Childhood Psychoses: Diagnostic Criteria and Classification,"* American Academy of Child and Adolescent Psychiatry 12, 32-34.

Landa, R. (2008) "*Diagnosis of autism spectrum disorders in the first 3 years of life".*Natural Clinic of Neuropsychologyvolume 4.

Lawson, W. (2004).*Reflection on Autism and Communication: A Personal Account.*Trainland: tripod.

Lorna, W. (1988).*The Continuum of Autistic Disorders.*New York; Plenum press.

Mark, C. (2009): *A review of the Efficacy of the Picture Exchange Communication System Intervention.*Sydney, Australia Marquarie University.

Mills, R. (2006). *Researching Intervention in Autistic Spectrum Disorders and Priorities.* Michigan: Gale groups.

Mirenda, P. (2001). *Autism, augmentative communication, and assistive technology.*Baltimore: P.H. Brookes.

Mirenda, P. and Beukelmen D. (1998).*Augmentative and Alternative Communication Management of Severe communication Disorders in Children and Adults with Autism.* Baltimore: P.H. Brookes.

Munsaka, E. And Matafwali, B. (2013) *Human Development from Conception to Adolescence: Typical and Atypical Trends.* Lusaka: University of Zambia Press.

Nelson NFER. (2009). *International Portage.Portage* NFER publishers.

Nyoni J. (2014) *The Impact on parents of raising a young child with autism.* International Journal of disability, community and rehabilitation.

Paul, R. (2007). *Language Disorders from Infancy through Adolescence: Assessment and Intervention.* St Lowis: Mosby.

Potter, P. And Brown B. (1997), *A comparison of Topography Based and Selection Based Verbal Behaviour in Typically Developed Children with Autism.* Tore Vignes: Stavanger Hospital Truest.

Robinson, P. And Trower, P. (1988) *Social Skills Training.* In Brekwell, GM., Foot, H, and Gilmour, R. Eds. *Doing Social Psychology.* New York: Cambridge University Press.

Rumrill, D. (2001) *Research in Special Education: Designs, Methods and Applications.* Illinois: Charles, C. Thomas Publisher, ltd.

Skinner, B.F. (1957). *Verbal Behaviour.* Engle Wood Cliffs: Prentice Hall

Sony, S. (2006). *Comparing two types of Augmentative and Alternative Systems for Children With Autism Communication*.Paediatric Rehabilitation. Prentice Hall.

Tincani, M. And Alazetta, L. (2006).*The Picture Exchange Communication System: Effects on Moulding speech development of School aged Children with Autism.* Michigan: Gale groups.

Travis, J. and Geiger, M. (2010) *The Effects of Introducing the Picture Exchange Communication System on the frequency of requesting. Michigan.*

Willemsen, S. And Buitelaar, K. (2002) *The Autistic Spectrum: Subgroups, Boundaries, and Treatment. Department Of Child and Adolescent psychiatry*. Michigan.

Wing, L. and Gould, J. (2000), *Severe Impairments of Social Interactions and Associate Abnormalities in Children*. Michigan: Gale groups.

World Declaration on Education (1990) *Education For All*.Jomtien: Darka.

www.Autistism.org. (2010). *Autistic Spectrum Disorders Nursing and Residential Care*. London. Visited on 29th March, 2010.

Zambia Ministry of Education Policy (1969) *Educating Our Future.* Lusaka: Government Printers.

Hewitt, A. (2009).*College of the Direct Support Services.Autism spectrum Disorders way forward.*University of Minesotta, Mineapolis

Hollins, S. (2007) *Books without words.* St Georges, London

Wolery, M, Bailey B.D., J.R. George and M. Sugai (1988), *Effective Teaching Principles and Procedures of Applied Behaviour Analysis with Exceptional Students*.Allyn and Boan, Inc. Boston London.

Grandin, T. (1982) *Thinking in Pictures. My life with autism.*Vintage books. Random House, New York.

Light, J.C., Beukelman, D.R. and Reichle, J. (2003)*Communicative Competence for Individuals who use Augmentative and Alternative Communication.*Paul H. Brookers. Baltimore, Maryland.

Morris, E., Smith, N., and Altus, D. (2005).*B.F. Skinners contribution to applied behaviour analysis.*28 (2), 99-131.

Preis, J. (2006) *Children and adolescents with autism spectrum disorders: The role of visual systems on language functioning*. Loyola College, Baltimore.

TagerFlusberg, H. (1981). *Sentence comprehension in autistic children,* New York Premium Press.

Quill, K. (1997). Instructional considerations for young children with autism: The rationale For visually cued instruction.*Journal of Autism and Developmental Disorders*.

Appendix (i)

CONCERT FORM

The study you are about to participate in is on the effects of picture exchange on the communication skills of autistic children. It is a study just to find out if at all picture exchange strategy can be used in order to help children with autism to communicate but not to test their cognitive abilities. The study employs strategies that have no potential harm to participants, and has been approved by the College of direct support professionals to be useful as they have used it before on their own line courses.

Should you agree to be in the study, you will be asked to participate in a variety of phases that the strategy uses but you will be trained in order to understand what will be expected of you.

All data collected from you will be given a different name from yours and some of it will be coded in order to protect your identity. This means that they will be no way to connect your name with your data.

Any additional information about the study results will be provided to you at its conclusion upon your request.

You are free to with draw from the study at any time.

Should you agree to participate please sign your name below, indicating that you have read and understood the nature of the study.

Date:……
Signature of participate:…….
Name:……..
Address:…….
Date:……..
Signature of researcher:…….

Appendix (ii)

Antecedent – Behaviour – Consequence Form – A-B-C Analysis (Before, during and after Intervention)

Name:_____ Date:_____ Observer: _____

Behaviour to be tracked: _____

KEY: Indicate the use of the picture by using the following symbols:

0	**1**	**2**
x	+	√
Did not use the picture	Used the picture with help	Used the picture independently

Date	**Antecedents**	**Behaviour**	**Consequences**	**Use of the picture to ask for the food of child's interest**
Baseline				
12/07/2010				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

23				
24				
25				
Intervention				
26/07/2010				
27				
28				
29				
30				
31				
01/08/2010				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
01/08/2010				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
01/09/2010				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

22				
23				
24				
25				
26				
27				
28				
29				
30				
01/10				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
After Intervention				
17/10/2010				
18				
19				
20				

21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
01/11/2010				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17/11/2010				

College of direct support services (2009)

Appendix (iii)

FOCUS GROUP DISCUSSION GUIDE
HOME BASED EDUCATION TEACHERS

- How did you know that the child you are teaching at home has autism?
- What is picture exchange strategy?
- Have you ever used the strategy before this study?
- Where you trained to teach a child how to use the picture exchange strategy for communication?
- During the study did you manage to visit the pupils once a week in order to observe what was happening?
- What was the attitude of parents/care-givers in teaching their own children the strategy?
- What can you say concerning the use of parents/care-givers in coding the ABC chart?
- How long did the pictures that were initially made for pupils to use last during the study?
- What were the challenges that were encountered during the study?
- Generally, can the picture exchange strategy be used to teach children with autism in Zambia?

Thank you for your time and the commitment given during this study.

Appendix (iv)

FOCUS GROUP DISCUSSION GUIDE
FOR PARENTS/CARE GIVERS

- How did you know that your child has autism?
- What is picture exchange strategy?
- Have you ever used the strategy before this study?
- Where you trained to teach a child how to use the picture exchange strategy for communication?
- What were the reactions from other family members upon learning the strategy?
- What were the attitudes of the community upon learning that the child was using pictures to ask for his/her preferred food?
- Did you receive enough support when you were teaching the child?
- How long did the pictures that were initially made for pupils to use last during the study?
- What were the challenges that were encountered during the study?
- Generally, can the picture exchange strategy be accepted by all the people that the child interacts with as a means of communication according to your experiences in this study?