DETERMINANTS OF SOCIAL INTERACTION AND THEIR EFFECTS ON LEARNING OF CHILDREN LIVING WITH AUTISM IN REGULAR PRE-SCHOOLS IN NAIROBI COUNTY, KENYA

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JUNE, 2018
DECLARATION

I declare that this thesis is my original work and has not been presented in any other university/institution for consideration. This research thesis has been complemented by referenced sources duly acknowledged. Where text, data including spoken words), graphics, pictures or tables have been borrowed from other sources, including the internet, these are specifically accredited and references cited using current APA system and in accordance with anti-plagiarism regulations.

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DEDICATION

I dedicate this thesis to my beloved husband Charles Nderitu Wagura and our children Ryan Wagura Nderitu, Trevor Macharia Nderitu and Joy Wanjiru Nderitu. “May God bless you with long life”

USAN
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ABBREVIATION AND ACRONYMS

CWA - Children with Autism

ADDM - Autism and Development Disabilities Monitoring Network

AD/HD - Attention Deficit/Hyperactivity Disorder

ASD - Autism Spectrum Disorder

ASD – CC - Autism Spectrum Disorder-Comorbid for Children

CDC - Centre for Disease Control and Prevention

CSHQ - Children’s Sleep Habits Questionnaire

DSMMD - Diagonistic and Statistical Manual of Mental Disorders

FGD - Focused Group Discussion

IDEA - Individuals with Disability Education Act

MoE - Ministry of Education

PDD - Pervasive Development Disorder

SI - Social Interaction

SNE - Special Need Education

TOM - Theory of Mind

UNESCO - United Nations Education Scientific and Cultural Organization
ABSTRACT

The purpose of this study was to investigate determinant of social interaction on learning of children with autism in regular pre-schools in Nairobi County. The research objectives of the study were prevalence of autism, preschool existing culture, nature of training of preschool teachers, diet of children living with autism, attitude of teachers towards children with autism. Studies show that countries like U.S.A, China, South Africa and Zimbabwe are including children with autism in regular schools. However, very little has been done in these countries on determinants of social interaction and their effects on learning of children living with autism. Similarly limited research studies have been done in Eastern Africa and especially in Kenya on determinants of social interaction and their effects on learning of children with autism in regular pre-schools; therefore, this study was intended to bridge that gap. The theory of mind and socio-cultural learning theory were both used in this study. The theory of mind looked at autism characteristics while social-cultural learning theory looked at social interaction of children living with autism. The descriptive design using survey method was employed in this study. The target population in this study was 6 regular pre-schools that integrate children living with autism in Nairobi County, 6 head teachers, 108 special needs teachers, 216 regular pre-school teachers, 108 teacher assistants, 216 parent of children living with autism. Purposive sampling was used in this study because the pre-schools selected are practicing inclusive education and the sample size used was small. The sample comprised of 3 preschools, 3(50%) head teachers, 15 (30%) special need teachers, 30 (30%) regular pre-school teachers, 15 (30%) teacher assistants, 30 (30%) parents of children living with autism and 12 (30%) occupational therapists, who were randomly selected. Questionnaires, interview schedules and focus group discussions were utilized to gather data. The validity of the instruments was checked by using content validity, having a pilot study and comparing, incorporating comments from key experts in area of study. The split-half method was carried out to estimate the reliability of the research instruments and a correlation coefficient (r) obtained was 0.85. The collected data was categorized, coded and analyzed thematically according to research objectives. The analyzed data was presented in form of frequency tables, pie charts and bar graphs. The results showed that pre-school existing culture, teachers’ training, and diet of children living with autism, and attitude of teachers towards children with autism as determinants of social interaction and their effects on learning of children with autism. Simple regression was used to find the relationship between two independent variables, that is, social interaction and attitude of teachers towards children with autism and dependent variable that is, learning. The results showed that social interaction of children with autism and attitude of teachers towards children with autism to learning was statistically significant; thus, there was a relationship and therefore the null hypothesis was rejected. A major recommendation was made to the government to initiate in-servicing of teachers on Autism Spectrum Disorder so that they could handle children with autism better.
CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.0 Introduction

This chapter highlights the background to the study, statement of the problem, purpose and the objectives of the study, research questions, significance of the study, limitation and delimitation of the study, research assumptions, Theoretical Framework based on Theory of Mind and Socio-Cultural Learning Theory and Conceptual Framework.

1.1 Background to the Study

Social interaction is the exchange between two or more people and this enhances the growth of the society. Through interacting people come up with rules, institutions and systems which enable them to live in harmony. However this can be challenging to children with autism because autism is a neuro-developmental condition. The child has delays in speech development, limited social relatedness and restricted interests and activities (America Academy of Child and Adolescent Psychiatry, 2010). The child may avoid direct eye contact and exhibit odd behaviors such as focusing on parts of objects (e.g. the spinning wheel of a toy car). There may be unusual motor movements such as hand flapping, self-stimulation or walking on toes.

In this study the researcher looked at how children living with autism; communicate with others; establish friendships, form positive social relationships, work with others, and in turn how this help them in their learning. Social interaction helps children to grow holistically whereby they develop relationships, social skills, values as well as ethics. This should be considered as an essential part of a child’s early education.
Reciprocating socially is a major educational goal for all pre-school children but this proves difficult for a child with autism. This is because normally they do not learn through observation and modeling, they require guidance to develop the skills necessary for social interaction (Howley and Arnold, 2005).

The best treatment approach for dealing with difficulties associated with learning of children with autism is the positive social interaction (Jordan, Jones and Murray, 1998). Learning is a continuous process, from the time the child is born and throughout the child’s school life. The human’s ability to learn thus continues in their lives but it is demonstrated most in the pre-school time. Thus, babies and toddlers need positive early learning exposure to help their intellectual, social and emotional development and this lays a strong foundation for later school success (Shonkoff and Phillips, 2000). Children learn through interacting with their teachers, parents and their peers. However lack of social reciprocity is major characteristic in persons living with autism and this affects their learning.

Inclusion of children living with autism in a regular school where they directly receive guidance from teachers and same-age peers provides them with the social network beneficial for their social and emotional growth (Kluth, 2003). However majority of children living with autism often avoid social interaction with their teachers and peers and this negatively affect their learning. Lack of skills on how to react in social situations make children living with autism feel out of place among strangers thus end up excluding themselves (Newsome and Havanitz, 1997).

In both developed and developing countries, there is rise in cases of autism spectrum disorders (ASD). The most paramount practice in daily living skills of persons living with
autism is teaching them social reciprocity. This enhances their learning when considering the future of an individual (Melisa Daily, 2005). Due to these rising cases, some countries have come up with policies mandating early diagnosis and intervention, availability of free suitable services, education, acceptance and placement of such children in mainstream schools (Gearheart and Wistatin, 1992). However, much has not been done to ensure that social interaction of children living with autism has been improved so that it does not impede their learning.

In America, it was observed that children living with autism significantly encounter problems in social interaction due to their behavioral disorders such as aggression, tantrums, self-injury among others (Association, 2002; Volkmar, Paul, Klin & Cohen, 2005). Still in America it was noted that children living with autism avoid interaction and are unable to maintain relationships. This affects their communication ability and response to peer groups (Myer & Johnson, 2007; Neft, Koegel, Singer & Gerber, 2010).

In Canada, Autism Society of Canada (2010) reported that children and adults with Autism Spectrum Disorder (ASD) have challenges on social interactions among other characteristics. This study did not in particular investigate how lack of social reciprocity of children living with autism affects their learning in terms of academic achievement. Therefore this study was intended to fill that gap.

In China, the law protects and safeguards the rights of individuals and the education of children with disabilities. However, pupils with autism, in regular schools use the same curriculum with children leading normal life, but are not allowed to take tests designed for their counterparts, that is, children leading normal life (Sun, 1990). This practice,
discriminates thus discourages learning of children living with autism. In early 1940s and mid-1960s, in the United States and South Africa respectively, serious endeavors were made to classify autism as a disability on its own. Despite these efforts to address its many challenges, many professionals felt that enough attention is not being given to the social and emotional needs of children with ASD in a school setting (Bryson, Rogers, and Fombonne, 2003).

In Africa and specifically in South Africa, this effort began when Dr. Vera Buhrman (1984) became aware of the extent of the problem of autism in Cape Town. To implement white paper 6 (2001), South Africa did major restructuring of education system. The aim was to include children living with autism in mainstream schools (Mittler, 2003). However other factors such social interaction of children with autism and how this may affect their learning were not considered. In Zimbabwe also in Africa the disabled persons Act of 1996 requires that all children, regardless of their race, religion, gender, creed and disability, access basic education.

Thus all schools are entitled to enroll all children regardless of their ability failure to which they violate Disabled Persons Act (1996) and therefore they should face disciplinary action from the District Education Office. However the Zimbabwe government did not point out how social interaction of these children should be enhanced to improve on their learning after inclusion. This made researcher eager to find out how social interaction in regular schools is fostered bearing in mind the placement of children living with autism. Thus this study sought to identify determinants of social interaction and their effects on the learning of children living with autism in regular pre-schools in Nairobi County.
In Uganda autism awareness is minimal. Facilities and services for children with special needs are inadequate. This leads to generalizing and mixing children with diverse disabilities. This impedes social interaction of children living with autism and ultimately their learning. There are few schools handling autism cases in Uganda and one such school is Komo Centre. The centre has an expansive curriculum with emphasis on increased social interaction with other children leading normal lives (Komo Centre, 2015)

During pre-school years, children with ASD may have; difficult eating solid foods, dislike of variety of foods, (Autism Victoria, 1998). A study in Kenya showed that diet is another factor that affects social interaction of children living with autism. Behaviour of children living autism improves when casein, gluten and sugar are removed from the diet. This is because casomorphin from milk products and glutenmorphin from wheat products often trigger opiate or morphin-like reactions in the body; however withdrawal symptoms such as insomnia, aggressiveness and refusal to eat sometimes occur when casein and gluten are removed from the diet. Sugary products make children with autism hyperactive thus disturbing those around them and they cannot settle down to learn (Ngungu, 2005).

Locally, that is, in Kenya, the Autism Society (2007) observed that autism is affecting approximately 4% of the Kenyan population. Due to prevalence of Autism in Kenya, a society such Autism Society of Kenya was founded in September 2003 by group of parents who had children with autism. The purpose of the society is to advocate for the needs of their children living with autism. The major functions of the Society is to offer diagnosis, assessment, write and publishes literature on autism spectrum disorder, gives therapy to children living autism, provide counseling services to parents and run autism awareness workshops all over Kenya.
In Kenya today, children with disabilities attend mainstream schools. The launch of The National Special Needs Education Policy in March (2010) was a big step for Kenya towards the achievement of the ‘Education for All’ goal. The policy advocates for provision of education for children with special needs through regular schools as opposed to the norm of special schools and special units in mainstream schools. The policy further advocates that ‘The Ministry of Education’ (MoE) shall recognize and encourage placement of children with special needs in mainstream schools so as to enable them access education”.

However the policy did not address the social interaction of children with special needs once they are integrated in mainstream schools. Jordan etal (1998) pointed out that social interaction is very important in the learning and emotional development of all children. However children living with autism lack social relatedness which is very vital in learning. This therefore made the researcher curious to find out determinants of social interaction and their effects on learning of children with autism. Also the researcher wanted to know how school fraternity fosters social interaction in their dealings with children living with autism.

The study specifically explored how pre-school existing culture, level and nature of training of teachers, children living with autism diet, attitude of teachers and children leading normal lives towards children living with autism as determinants of social interaction of children living with autism. It is against this background that this study sought to find out determinants of social interaction and their effects on learning of children living with autism in regular pre-schools in Nairobi County.
1.2 Statement of the Problem

Children learn a lot through social interaction with their parents, teacher and peers. Unfortunately much current research suggests that the lack of social reciprocity is the primary symptom in autism. Teaching individuals with ASD how to form relationships and understand the feelings of others is very important to achieve academic learning when considering the future potential of an individual. Since this is the greatest area of weakness in children with autism, schools bear responsibility to work this into the curriculum to train children with autism positive social interaction whether in the regular educational setting or the special education classroom. Schools do not always put into consideration this responsibility. Enough attention is not being given to the social and emotional needs of children living with autism in mainstream schools. The researcher therefore felt the need to fill this gap in research and available information.

National Special Needs Education Policy (2010) advocated for inclusive education for persons living with disabilities. To adhere to this many pre-schools in Kenya are practicing inclusive education. Despite the fact that there is inclusive placement, the curriculum has not been restructured to ensure that autistic children are trained on positive social interaction that will enhance their learning. In order to implement Universal Primary Education (UPE) more emphasis was put on special need education. Mainly the SNE catered for visually challenged persons, those with hearing difficulties, mentally challenged and those motor difficulties.

Currently in Kenya there is much acceptance of people living with disabilities including those with autism. Due to public awareness there is more demand for SNE of persons having different challenges including autism. Several studies have been carried out in
Kenya in area of autism including their inclusion in regular schools but no study has been carried out to investigate how children living autism socially interact once they included in mainstream classes. Due to this reason the researcher sought to investigate determinants of social interaction and their effects on learning of children living with autism in regular pre-schools in Nairobi County focusing on the pre-school existing culture, teachers’ training, diet of the children living with autism, and attitude of teachers towards children living autism. In connection with social life of children living with autism it was then of great need to investigate determinants of social interaction and their effects on learning of children living with autism in regular pre-schools in Nairobi County.

1.2.1 Purpose of the Study

The purpose of this study was to find out determinants of social interaction and their effects on learning of children living with autism in regular pre-schools in Nairobi County.

1.2.2 Research Objectives

a) To establish the prevalence of children living with autism in regular pre-schools that integrates children of different disabilities.

b) To find out the influence of pre-school’s existing culture on learning of children living with autism in regular pre-schools.

c) To establish the influence of nature of training of pre-school teachers on learning of children living with autism in a regular pre-school.

d) To examine the influence of diet of children with autism on their learning in a regular pre-school.
e) To determine whether there is a significant relationship between social interaction of children living with autism and their learning.

f) To establish whether there is a significant relationship between the attitudes of teachers on learning of children living with autism in regular pre-schools.

1.2.3 Research Questions

a) What is the prevalence of children living with autism in regular pre-schools that integrates children of different disabilities in Nairobi County?

b) How does pre-school existing culture influence learning of children living with autism in regular pre-schools?

c) How does the nature of training of pre-school teachers influence learning of children living with autism in a regular pre-school?

d) How does diet of autistic children influence their learning in a regular pre-school?

1.2.4 Hypothesis

$H_{o1}$ There is no significant relationship between social interaction of children living with autism and their learning

$H_{o2}$ There is no significant relationship between the attitudes of teachers on learning of children living with autism in regular pre-schools.

1.3 Significance of the Study

This study was undertaken to fill the gap in knowledge of the public on determinants of Social Interaction (SI) and their effects on learning of Children living with autism in regular pre-schools. The findings may also help school administrators, pre-school teachers, occupational therapist and society at large to reflect upon and act on some of the
constraints that are a barrier to social interaction of children living with autism thus hindering their learning.

The study findings may help ground the issues affecting social interaction of children living with autism thus posing difficulties in their learning in pre-schools and beyond. There is need to help children living autism to grow to be well adjusted persons by assisting them know how to socially interact. The study may lead to making recommendations for necessary policy changes.

1.4 Limitation and Delimitation of the Study

1.4.1 Limitation of the Study

It was difficult to convince some head teachers to grant permission to collect data in their schools as they felt it was a way of exposing them on how they treat children living with autism in their schools. Even after creating a good rapport and ensuring them of confidentiality, some participants treated the exercise with suspicion hence unwillingness to submit important information. Some participants could not fill the questionnaires on time and therefore the researcher was forced to go back at a later date to collect them.

1.4.2 Delimitation of the Study

The study only focused on determinants of social interaction and their effects on learning of a children living with autism. It confined itself to prevalence of autism, pre-school existing culture, nature of training of teachers, diet of children living with autism and attitude of teachers towards children living with autism as determinants of social interaction of children living with autism and the way they affect their learning.
1.5 Assumptions of the Study

The researcher assumed that the information obtained from the sampled preschool will give full information of all the preschool in the Nairobi County practicing inclusive education. Lastly, the researcher assumed that the study findings will be useful in providing answers to research question.

1.6 Theoretical and Conceptual Framework

Theoretical Framework

This study was guided by two theories, that is, Theory of Mind and Socio-Cultural Learning Theory. The Theory of Mind explains the typical autistic behaviors and impairment that impedes them from relating well with other people that teachers, caregivers, non-autistic children and parents should understand. The Socio-Cultural Learning theory explains about the Zone of proximal development, whereby Vygotsky explains about learning of children living with autism through interaction with other people and environment and the importance of giving support to the learners. Children living with autism have difficulty in social interaction but when trained on positive social interaction they can improve on their learning. Secondly if children living with autism are put in the environment encouraging positive social interaction they can learn. Finally, if they interact with able adults and peers they can learn.

Theory of Mind

The Theory of Mind (ToM) by Armstrong, (1980) explains that typically developing infants are social beings. They can gaze at people, grasp on fingers, smile and follow voices.
In contrast, children living with autism do not look directly at the peoples’ face to get facial cues when interacting. Also, they have problems in learning everyday human interaction.

When young children start to understand facial expressions of other people, they are able to use nonverbal information to guide their behavior. Dawson and Osterling (1997) studied videotapes of first birthday parties of typical children and some children who later were discovered to have Autistic Disorder who lacked to see other people’s gaze. This discovery explains why children living with autism do not see the gaze of other people to guide their behavior, thus making their social interaction with other people difficult. Children learn through interacting, however, children living with autism found social interaction very difficult, thus making their academic learning even more difficult.

Thus, the theory urges that the great challenge of children living with autism is social interaction. Therefore, the researcher encourages parents, siblings, school administrators, teachers, and their other children leading normal lives to understand social and emotional challenges of children living with autism. They should give them appropriate assistance and guidance to enable them to attain some level of development in their social interaction, which in turn will improve their learning, especially their academics. The aim of this study was to investigate social interaction and its implications on learning of autistic children in regular pre-school in Nairobi County.

**Socio-cultural Learning Theory**

Vygotsky’s socio-cultural theory (1978) of human learning explains learning as a social process through other people, culture, and society at large. The major aim of Vygotsky’s
Theoretical framework is that social interaction plays a very important role in the development of cognitive domain leading to learning. Vygotsky believed everything is learned on two levels. That is, first through interaction with others, and then this is integrated into the individual’s mental structure and this leads to learning. A Child’s cultural development appears first on the social level, followed by individual level; this means, first between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals (Vygotsky, 1978).

The second aspect of Vygotsky’s theory is the development of cognition which is limited to a zone called Zone of Proximal Development (ZPD). In this zone the student’s cognitive ability is prepared, but not without help and social interaction for it to fully develop (Briner, 1999). A more experienced person who can be a teacher or peer is able to support the learner develop knowledge domains or develop complex skills thus facilitating intentional learning. This can be achieved through collaborative learning, discourse, modelling, and scaffolding. The fundamental role of this theory is to show the social interaction with others especially more experienced adults and peers.

This theory indicates that the social interaction influences cognitive development of an individual. Vygotsky points out that the development occurs in the zones and focuses on the interaction between people and their culture and the environment which they interact and share experience (Crawford, 1996 cited by Mwakalinga, 2012). This theory puts more emphasis on giving support and having collaborative learning with learners especially those with disabilities including autism.
More capable peers and adults give problem solving skills. Social cultural learning theory emphasizes on supporting the education for special needs students especially those with autism since it encourages teachers to assist all learners in the classroom. The school environment and materials used should be enhanced to promote and encourage learners through social interaction to attain maximum development. The zone of proximal development requires the teacher to guide and support the learner, by making classroom/school activities to be as much as possible simplified so as to motivate them. Teachers should assist learners to avoid discouragement (Hausfather, 1996 cited by Mwakalinga, 2012).

This theory has an impact on Special Need Education and specifically to children living with autism because it emphasizes on inclusive education. In this study the researcher emphasized that learners with ASD need special assistance and guidance from parents, siblings, school administrators, teachers and their counterparts leading normal lives to attain some level of development through the social interaction. The aim of this study was to investigate the determinants of social interaction and their effects on learning of children living with autism in regular pre-school in Nairobi County.

**Conceptual Framework**

Social interaction and learning of children living with autism depends on the condition of the autistic child, the prevalence of autism, the pre-school existing culture, that is, whether the culture and school environment favor the inclusion of the children living with autism, the nature of training of teachers, the diet of autistic children and attitudes of teachers toward children living with autism. There are different teaching approaches/methods which have been suggested by different literature to assist autistic
children evaluate and understand their social environment which ultimately enhances their learning. These include; Repetitive action, Intensive interaction, optional approach, musical assisted the multitier approach among others to encourage their social interaction and ultimately their learning. During inclusion of children living with autism in mainstream classes it is important to consider how they interact and with those they interact so as to boost their self-esteem and hence their learning. A child with autism should be included in mainstream classes and when included, their social interaction should be catered for to enhance their learning.

In Kenya, the issue of inclusion is still in its initiation and experimental stage, whereby learners with disability attend regular classes with those without, but much has not been done to ensure that pupils with disabilities interact socially well with those without disabilities. In this study, the researcher considered determinants of social interaction and their effects on learning of learners with ASD included in regular classes in pre-schools in Nairobi County.
The problem as conceptualized is presented in figure 1.1 below.

**Independent variables:**

SI as characterized by:

- Prevalence of Autism
- Pre-school Existing Culture
- Nature of training of teachers
- Diet of Autistic Children
- Attitude of teachers and non-autistic children towards autistic children

**Intervening Variables**

- Inclusion of Curriculum
- Repetitive Approach
- In-service of teachers
- Autism sensitization to teachers and non-autistic children
- Regulating diet of Autistic Children
- A Culture enhancing Social Interaction

**Dependent Variables**

- Learning of Autistic Children
  - Acceptance of autistic children
  - Well adjusted autistic children
  - Knowledgeable teachers on autism
  - Tools of awareness to the public
  - Social interaction culture developed

**Outcomes**

Figure 1.1: Social Interaction and its implications on learning of Autistic Children

Source (Researcher2016)
1.7 Operational Definition of Terms

**Attitude of teachers** - This refers to tendency of teachers to respond either positively or negatively towards children living with autism.

**Autism Characteristics** - This refers to the behavior of the children living with autism in Sampled pre-schools.

**Children Living With Autism** - These are children in the preschool sampled who have neurobehavioral disorder that includes impairments in social interaction, developmental language, communication skills, rigid and repetitive behaviors.

**Diet** - This refers to the foods that when taken by children living with autism that affects them.

**Determinants** - Something that has effect on learning of children living with autism.

**Learning** - This refers to the academic achievement of children living with autism as influenced by their social interaction.

**Non-Autistic Children** - Refers to children who are not autistic and also do not have any pronounced special need in the regular pre-school sampled.

**Nature of Teacher’s Training** - This refers to the type of training that is, whether a teacher is trained as a regular teacher or a special needs teacher.

**Pre-school Existing Culture** - This refers to the school physical resources, human resources and teaching methods before and after inclusion of autistic children in the regular schools.

**Prevalence of Autism** - This refer to number of cases of children living with autism

**Regular Pre-school** - Refers to nursery section in a school of children with no special need. That is baby class to Pre-unit.

**Social Interaction** - This refers to the way children living with autism; communicate with others, establish friendships, form positive social relationships, work with others, that is, their peers and teachers, play with their peers and share with their teacher, peers and others.
CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction
This chapter gives overview and summary of the prevalence of autism, existing preschool culture, and influence of teachers’ training and diet of children living with autism, social interactions of children living with autism. It also covers attitudes of teachers towards children living with autism. According to Singleton, Bruce, Margaret & Ronald (1998), literature review elaborates the theoretical materials of the problem under assessment and how others have studied it. This is vital for the identification of the gaps in knowledge and creation of an entry point for the proposed study (Orodho, 2003).

2.2 Social Interaction
Social interaction refers to the way children living with autism; communicate with others, establish friendships, form positive social relationships, work with others, that is, their peers and teachers, play with their peers and share with their teacher, peers and others.

However making friends can be very difficult for young children, but children living with autism face even more challenges in relating to people. Finding social interaction enjoyable is one of the natural built-in challenges with children living with autism (Mesibov, 1986). Due to this difficulty, parents and teachers should ensure that children living with autism are around people who make social interaction enjoyable. Just as reading can be a challenging skill for normally developing children to acquire and enjoy doing, children living with autism often find it difficult to be around people and enjoy conversation or human contact even with those they know. It is very important to first
make social interaction fun when helping a child with autism to socialize with his or her peers, (Mesibov, 1987).

In a study, Killen and Smetana (2003) conducted two studies on social interactions in pre-school classrooms and the development of young children’s conceptions of the self. The two studies covered a pre-school teacher and child social interactions as pertains to personal, moral, and social-conventional skills in the classroom and the development of personal skills in the young children. The first study comprised of, 20 pre-school classrooms, 10, 3 years old children and 10, 4 year old children were the study sample. The study involved children’s and teachers’ social interactions regarding personal, moral, social-conventional and mixed aspects. The results showed teachers used more direct language as pertains to moral and social-conventional aspects than personal and mixed aspects.

It was also found that teachers, offered children choices, though they do not often negotiate personal concepts with children. Another finding was that children responded with their own choices when adults offered them choices, but adults frequency did not differ but they agreed on children's assertions of own choice. The second study comprised of 120 pre-school children who were interviewed on their conceptions of personal aspects in the classroom and home. As children grow older they judge what to retain and have control over in both classroom and at home. In both judgment and social interaction both teachers and children had personal aspect whereby children could make choices about how to organize their activities and have independence in the classroom.
In yet another study, Center on the Social and Emotional Foundation for Early Learning (2006) conducted a study on promoting positive peer social interaction. The purpose of the study was to teach children how to initiate social interactions with their classmates during large group activities such as a circle time or story time. The study was carried out at Cherokee Trial Pre-school in United State of America and found out that as children watch, imitate, model and interact with each other, they learn to share, solve problems and collaborate. Also as the children relate with each other they become friends and that encourages positive social and emotional growth. When social interaction is encouraged in an inclusive school setting, children leading normal lives also benefit because they become more accepting of children with special needs.

A similar study on building social interaction in shy pre-school children was conducted by Parent-Child Services Group (2009). The purpose of the study was to have an environment encouraging shy children to have one-to-one play with preferred playmates and this makes it easier for them to learn skills to socially interact without being shy. The study dealt only with shy children but not children living with autism. It is from this insight this study proposed to investigate determinants of social interaction and their effects on learning of children living with autism in pre-schools in order to find out whether or not they receive positive help to support them learn to socialize with others.

According to the article 15 (freedom of association) United Nations Convection on the Rights of Children (1989) every child has the right to interact with other children and young people and to join groups and organizations, as long as this does not interfere with other people’s rights. The above studies in social interaction dealt with children leading normal life and shy children. It is from this insight the researcher investigated
determinants of social interaction and their effects on learning of children living with autism in Nairobi County, Kenya.

2.3 Prevalence of Autism

Autism and Developmental Disabilities Monitoring Network of Autism Spectrum Disorders (2006) carried a study on Prevalence of Autism Spectrum Disorders in United States. It was an estimate of children aged 8 years through a systematic retrospective review of evaluation records in multiple sites participating in the Autism and Developmental Disabilities Monitoring (ADDM) Network. Data for 2006 was obtained from existing records in 11 ADDM Network sites namely; Alabama, Arizona, Colorado, Florida, Georgia, Maryland, Missouri, North Carolina, Pennsylvania, South Carolina and Wisconsin. The data for 2002 and 2006 was compared to analyze changes in identified ASD prevalence in the above 10 sites except Florida. To identify children with ASD, existing health records having professional assessments for children aged 8 were studied either at health facilities or at school. In the year 2006, 2,757 (0.9%) of 307,790 children aged 8 years living in the 11 ADDM sites were found to have ASD, indicating an overall average prevalence of 9 per 1,000 population. This implies that in 2006, on average, approximately 1% or one child in every 110 in the 11 ADDM sites was noted as having ASD.

Currently, the prevalence of autism has shown an upwards trend since the Centers for Disease Control and Prevention (CDC) in 2014 estimated that 1 in 68 children (or 14.7 per 1,000 eight-year-olds) in multiple communities in the United States had ASD. This was approximately 30 percent higher than previous estimates in 2012 of 1 in 88 children (11.3 per 1,000 eight year olds) being classified to have ASD. The number of children found with ASD ranged from 1 in 175 children in Alabama to 1 in 45 children in New
Jersey. The findings also showed that boys are almost five times affected by ASD than girls: 1 in 42 boys versus 1 in 189 girls. ASD is more common among white children than in black or Hispanic children.

The above studies were done in United States. This made the researcher curious to find out the trend in prevalence of autism in Kenya and in particular in Nairobi County. Autism Society of Kenya had identified the prevalence of autism to be approximately 4% of the Kenyan population in 2007 thus the researcher what also wanted to investigate whether the prevalence has either increased or decreased.

2.4 Pre-school Existing Culture

A study published in the journal of Autism by Attwood (2004) who compared the differences in results of cognitive development when children living with autism were placed in pre-schools having children with autism only, in pre-schools educating children with different special needs, or in pre-schools having both children living with autism alongside those with normal development. The study showed that there was greater positive change on cognitive development of children living with autism attending inclusive pre-schools than those attending non-inclusive pre-schools. Autistic children have both verbal and non-verbal communication challenge; however, those who attended inclusive pre-schools showed great achievement on communicative ability. From the study above it is very clear children living with autism in inclusive education did better than their counterparts in non-inclusive education. This therefore made the researcher eager to find out whether the pre-schools existing culture which indicators include the teaching methods, the personnel among others whether it had effect on learning of children living with autism in school practicing inclusive education in Nairobi County, Kenya.
Learners with disabilities have different special needs; therefore unsuitable environment within the school may hinder their learning. In order to curb such a problem, the school environment should be adjusted to accommodate the learner’s diverse needs. This involves re-organizing the classroom and the school compound (UNESCO 2004a, 2001). The physical adaptations in a school may include landscaping, building ramps instead of staircases, building child-friendly toilets, enlarging classroom windows and painting walls with attractive pictures and improving lighting (Cheshire, 2004).

2.5 Teacher Training

Kyung-Hee (2008) carried out a study on effect of teacher and peer training on social interactions of children in an inclusive pre-school. The purpose of this study was to train teachers and peers who had been noted lacking social interactions to interact more in an inclusive pre-school in Korea. The participants were grouped into fours, that is, four children with disabilities who were noted by teachers as lacking social interactions with peers and teachers, who were the main subjects of the research study, four teachers and four peer children leading normal life. Two interventions were used. Firstly an initial training for teachers on naturalistic teaching strategies and secondly, children leading normal life and those with disabilities were trained on social skills in a combined intervention. A multiple probe design was used to investigate the influence of the two interventions during free choice play time. The study found that training of teachers on naturalistic teaching strategies had influence on social skill in an inclusive pre-school setting in Korea, thus promoting social interactions of children with special needs which eventually improve their learning. This study investigated influence of teachers’ training on social interaction of children leading normal lives and children with disabilities in Korea. This influenced the researcher to investigate determinants of social interaction and their effects on learning of children living with autism in Nairobi County, Kenya.
In a related study, Mwakalinga (2012) explored contribution of teachers on the development of social interaction for learners with ASD in Arusha, Tanzania mainly in primary schools. This study intended to find out the support of teachers in social interaction of children living with autism and in particular how teaching methods and techniques in place contribute. The study sought to answer the question; how teachers influence the development of social interaction for learner with ASD. Therefore the participants were the teachers for learners with ASD. The study findings showed that teachers play a vital role in the development of social interaction of children living in autism despite the difficulties they face. Based on the findings, the study recommended that teachers should get trained to acquire skills to deal with ASD. In addition, the study suggested that the government and other stakeholders should cater for education of learners with autism partially and if possible fully. The researcher also recommended for continuous in-service of special need education teachers in order to improve special need education. Based on these studies which showed that teachers training had effect on social interaction of children with disabilities and especially those with autism, thus researcher sought to find out whether the teachers training in the schools sampled had influence on learning of children living with autism in regular pre-schools in Nairobi County.

2.6 Dietary Effects

Whiteley, Rodgers, Savery & Shattock (2012) carried out a study on a gluten-free diet as an intervention for autism and associated spectrum disorders. They fed children with autism with foods without gluten for a period of five months. Data was collected using parents/teachers interviews, questionnaires, observation reports, psychometric tests and urinary profiling. The findings of the study showed that participants on gluten-free diet indicated an improvement on several behavioral challenges.
Also the findings showed that there was no significant decrease in compounds excreted through the urine when controls and gluten challenge group were compared. Children with ASD mostly improve when casein from milk and gluten from wheat are removed from their diet, because casormophin, glutenmorphin often trigger opiate or morphine-like reactions in the body (Ngungu, 2005)

Mannion, Leader, & Healy (2013) examined the frequency of comorbid disorder in children and adolescents with ASD to predict sleeping difficulties. The study involved 89 participants. Demographic information such as age, gender, level of intellectual ability, presence of epilepsy, attention deficit/hyperactivity disorder (AD/HD) and an anxiety disorders were obtained using a personal demographic questionnaire. Assessment of signs of comorbid psychopathology was done using autism spectrum disorder-comorbid for children (ASD-CC). Also other research tools used included children’s sleep habits questionnaire (CSHQ) and gastrointestinal symptom inventory to examine sleeping difficulties and gastrointestinal symptoms respectively. Sleeping difficulties and level of intellectual disability indicated the presence of gastrointestinal symptoms. Specifically those with intellectual ability were more likely to have no gastrointestinal symptoms. Comorbid psychopathology score and some autism characteristics such as worry/depressed, anti-social, hyperactive and tantrum are signs of the presence gastrointestinal symptoms.

There is much scientific literature currently which indicates that autism characteristics may be due to the brain chemistry being interfered with due to these “opioid-like peptides.” Thus due to this diet intervention is normally recommended. Foods containing salicylate such as; apples, berries, cucumbers, grapes, nectarines, oranges, peaches,
plums, prunes, raisins, tangerines, and tomatoes have similar effects to autistic child’s body as gluten and casein. Also other fruits containing low-salicylates and low-sugar include pears, grapefruits, lemons, limes, kiwis, coconuts, and papaya also affects brain of children living with autism. We should also bear in mind that brain of children living with autism is affected when they take milk products for example, yoghurt and wheat products for example, bread. Also they become hyperactive when they take sweet foods. The above studies shows that when children living with autism take foods with sugar, wheat and casein they become hyperactive. Therefore this study strived to find out whether the hyperactivity of children living with autism affects their social interaction and ultimately their learning.

2.7 Academic Learning of children living with Autism

Erik W. Carter, Lynn G. Sisco, Lissa Brown, Dana Brickham, and Zainab A. Al-Khabbaz (2008) carried study on peer interactions and academic engagement of youth with developmental disabilities in inclusive middle and high school classrooms in a school in America. The purpose of the study was to examine the peer interactions and academic engagement of 23 middle and high school students with developmental disabilities within inclusive academic and elective classrooms. The extent to which students with and without special needs interacted socially was highly vital and influenced by instructional methods, special educators, and co-curricular activities. Peer interactions was achieved when mostly in small groups without receiving direct support from a paraprofessional or special educator, and in elective subjects. Academic engagement also varied, being attained mostly during one-to-one or small group instruction and when in close proximity to an instructor.
The findings suggested sufficient opportunities for peer interaction and meaningful core curriculum activities improve academic achievement of students with developmental disorders. This study singled out and only dealt with children living with autism. Thus the researcher investigated how academic achievement of children living with autism is affected by their social interaction.

2.8 Attitude of Teachers towards Children living with autism

Attitude of teachers and towards children living with autism affect the way the later behave socially. Mushoriwa (2001) argues that before practicing inclusive education in a regular school setting, it is vital to examine the attitude of the school administrators, teachers and children leading normal life towards children with disability. This is because attitude is either greatest obstacle or the greatest asset to progress of inclusive education. The attitudes comprises of likes/dislikes, associations, passion, desires, beliefs, hopes, judgments and argument among others. McLeskey & Waldron (2002) study findings suggest that inclusive school setting can only succeed if teachers have positive attitude and there are support system in place such as co-operation between special need education teachers and regular education teachers, benchmarking, team and parallel teaching and teachers’ training and workshops.

In yet another study, by Milson (2006) on Creating Positive School Experiences for Students with special needs whose purpose was to determine the attitude of students leading normal life and teachers on persons with special needs and found that students leading normal life and teachers possess somewhat negative attitudes toward students with special needs, or that they view themselves as different from and superior to persons with special needs. In another study, Gething, LaCour, & Wheeler (1994) provided
comparisons of school counselors and educators which focused on teachers and examined their attitudes toward inclusion of students with disabilities included in their mainstream classes. The study findings indicated that school administrator, teachers and students leading normal life might have possessed slightly negative attitudes toward students with special needs and that the attitudes of school counselors were the same too, if not more positive than those of other school administrators and teachers.

A meta-analysis of research studies published from 1990 to 2000 by Nowicki & Sandieson (2002), investigated the attitudes of children leading normal life toward children with special needs. The study findings were that children without disabilities were more comfortable to interact with children without either physical or intellectual disabilities. In addition, McDougall, Dewit, King, Miller, & Killip (2004) investigated the attitudes of ninth-grade students toward students with special needs and found that, despite the fact that most of them had attitudes classified as neutral to positive, above 20% had negative attitudes. Female were found to have slightly more positive attitudes than their male counterparts. Also in the study findings, it was evident that students who had a friend or classmate with a special need had more positive attitudes than those students without. Lastly, Hastings & Oakford (2003) in yet another study found that teachers had more negative attitudes toward students with behavioral and/or emotional challenges than toward students with cognitive difficulties.

In another study, Odongo (2012) investigated the attitudes, perceptions and concerns of Kenyan teachers towards the inclusion of children with disabilities in mainstream classes. The purpose of the study was mainly to examine the attitudes and concerns of Kenyan teachers on inclusive education.
This was carried out in 10 primary schools in Western Kenya practicing inclusive education. The participants of the study were 142 primary school teachers. The overall findings indicated that teachers had positive attitude towards inclusive education. However, teachers were identified to be an obstacle to the successful implementation of the inclusion. Thus it was noted that attitudes, perceptions and the concerns of the teachers influence their acceptance and commitment to the implementation and success of inclusive education.

The findings of the above studies show that most teachers and students without the disabilities seemed to have negative attitude towards students with disabilities. The researcher thus sought to investigate whether the attitude of teachers towards children living with autism in particular had effect on learning of children living with autism in regular pre-schools in Nairobi County, Kenya.

2.9 Summary of Reviewed Literature

The reviewed literature established that there were very few studies on determinants of social interaction and their effects on the learning of autistic children in both developed and in developing countries. In developing countries such as Kenya, this information is limited and this study hoped to fill the gap putting into consideration some pre-schools in Kenya particularly in Nairobi County are practicing inclusive education. The research indicates that prevalence of autism, pre-school existing culture, nature and level of training of teachers, diet of children living with autism and attitude of teachers towards learning of children living with autism.
 CHAPTER THREE  
RESEARCH DESIGN AND METHODOLOGY  

3.1 Introduction  
This chapter explains the methods that were used to carry out this study. It focused on research design, location of the study, target population, sampling techniques, sample size, research instruments, piloting, data collection methods, data analysis, logistics and ethical considerations.  

3.2 Research Design  
This study is descriptive in nature and it involved the survey method to investigate determinants of social interaction and their effects on the learning of children living with autism. The survey method was used because it determines and reports the way things are and tries to describe things such as behaviour, attitudes, values and characteristics which are widely used in this study. The survey method involves collecting information by interviewing and administering questionnaires to a sample of individuals. The survey method is also used when collecting information about people’s attitude, opinions, habits or any of the variety of education or social issues (Orodho and Kombo, 2002). This study involved getting teachers’ opinions, attitudes and concerns towards pupils living with autism. The current study used interview schedules, focused group discussion and questionnaires to gather information from the participants and therefore the survey method was the most suitable research design for this study.
3.2.1 Research Variables

A variable is a measurable characteristic that assumes different values among the subjects and, therefore, a logical way of expressing a particular attribute in a subject (Mugenda and Mugenda, 2003).

i. In this study the independent variable was determinants of social interaction which includes; prevalence of autism, pre-school existing culture, nature of teachers’ training, diet of the autistic children and attitude of teachers towards autistic children. Determinants of Social interaction were measured in various ways:

a) Prevalence of autism

This refers to the percentage of children living with autism in a given population of children. This measured by response of the headteachers in question 4 of their interview schedule.

b) Pre-school existing culture

This refers to the school physical resources, human resources and teaching methods before and after inclusion of children living with autism in the regular schools. This was measured by adding up the number of cases from the response given by pre-school teachers and teachers assistant according to Section B of the pre-school teachers and teacher assistants’ questionnaire. It was also measured by the responses of head teachers in question 5 and 6 of their interview schedule. This variable was also measured by the summed up responses of occupational therapists in their focused group discussion question 3 and 4.

c) Nature of Training of Teachers and Teachers Assistants

The nature of training refers to whether teachers are regular or special need teachers. It was measured by comparing and summing up the responses from the headteachers in question 13 of their interview schedule and it was also measured by responses of teachers and teacher assistants in their questionnaire Section C.
d) Diet of Children Living with Autism

This refers to the foods children living with autism should take but more emphasis was put on the foods which should be removed from their diet. It was measured by adding up the responses of teachers and teachers assistants in Section D of their questionnaire. It was also measured by summing up the responses of headteachers in question 8 in their interview schedule. Responses of parents in their focused group discussion questions 5 to 11 also measured this variable.

e) Social interaction of children living with autism

This refers to the way children living with autism, communicate, play, and establish friendships, form positive social relationships and work with others.

It was measured by adding up the number of cases from the responses given by the teachers and teachers’ assistants according to Section F of their questionnaire. It was also measured by examining a number of responses from headteachers according to question 9 of their interview schedule.

f) Attitude of teachers towards children living with autism

This refers to how teachers perceive, treat and handle children living with autism.

It was measured by adding up the number of cases from the responses given by the teachers and teachers’ assistants according to Section G of their questionnaire. It was also measured by examining a number of responses from occupational therapists according to question 2 of their focused group discussion and responses from headteachers according to question 10 of their interview schedule.

ii. Dependent variable in this study was learning of children living with autism. It was measured by adding up the number of cases from the responses given by the teachers and teachers’ assistants according to Section H of their questionnaire.
3.3 Location of the Study
This study was carried out in three regular pre-schools having both children living with autism and children leading normal life in Nairobi County. Nairobi County was the most suitable location of the study because the schools practicing inclusive education have done it for a longer time. Thus the researcher felt that the target population is reliable for this study.

3.4 Target Population
The target population of this study comprised 6 regular pre-schools that integrate children living with autism in Nairobi County, 6 head teachers, 108 special need education teachers, 216 regular teachers, 108 teacher assistants, 216 parents and 126 occupational therapists.

3.5 Sampling Techniques and Sample Size
The methods used to select the study sample are discussed below.

3.5.1 Sampling Techniques
Six pre-schools that integrate children living with autism were purposively selected because very few schools offer inclusive education for children with autism in Kenya. Purposive sampling is often used when working with very small samples such as the one in this study and when one wishes to select cases that are particularly informative (Neuman, 2000). In this case, all the headteachers, special need education teachers, regular teachers, the occupational therapist, teacher assistants and parents were purposively sampled in the three schools in Nairobi County. Secondly, purposive sampling was the best in this study because the selected schools practice inclusive
education thus getting information rich cases for in-depth analysis related to the major issues being studied. Thereafter 14% random selection of special need teachers, regular teachers, occupational therapists and teacher assistants was done from all the 6 preschools. A sample size of 10-30% is adequate in descriptive study (Fraenkel and Wallen, 2002).

3.5.2 Sample Size

Multistage sampling is a method that divides large populations into stages to make the sampling process more practical. Multistage sampling technique as described by Fraenkel & Wallen (2002) was used to select the sample size as follows:

a) **County**: Nairobi County was purposively selected due to the fact that preschools practicing inclusive education have done it for a longer time as compared to other counties.

b) **Pre-school**: All the 6 regular pre-schools that integrate children with autism were purposively selected and 50% (3) of them were randomly selected through rotary.

c) **Head teachers**: All the 6 head teachers were also purposively selected after which 50% (3) of them were randomly selected.

d) **Special Needs Teachers**: All 108 special need teachers were randomly selected and 14% (15) were picked.

e) **Regular teachers**: Out of 216 regular teachers 14% (30) were randomly selected.

f) **Teacher Assistants**: Out of 108 teachers assistants 14% (15) were randomly selected.

g) **Occupational therapists**: All 126 were purposively selected and 14% (18) of them were randomly selected.

h) **Parents**: All 216 parents were purposively selected and 14% (30) of them were randomly selected.
Table 3.1 Sampling Frame

<table>
<thead>
<tr>
<th>Category of Participants</th>
<th>Target Population</th>
<th>Sample Size</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-schools/ Headteachers</td>
<td>6</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>Special Needs Teachers</td>
<td>108</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Regular Pre-school Teachers</td>
<td>216</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>Teacher Assistants</td>
<td>108</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Parents of Autistic Children</td>
<td>216</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>Occupational Therapists</td>
<td>126</td>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>

3.6 Research Instruments

The data collection instruments included a questionnaire for the special needs teachers, regular teachers and teacher assistants, while semi-structured interview schedules were used with headteachers, Focus group discussion (FGDs) schedules were used with occupational therapists and parents.

3.6.1 Questionnaires

The questionnaires were administered to the special need education teachers, regular teachers and teacher assistants (appendix i). Questionnaire was selected as the research instrument because it ensures privacy and it is time-saving. The questionnaires had both closed and open-ended questions. It sought information on the teachers’ and teacher assistants’ bio data, their nature of training and teaching experience, their opinions on determinants of social interaction and their effects on learning of children living with autism regular pre-schools in Nairobi County.

3.6.2 Interview Schedules

Interviews were conducted with headteachers and were guided by an interview schedule (appendix ii). An interview schedule is good research instrument because it gives in-depth information about particular cases since the researcher seeks information on specified issues.
(Kombo and Tromp, 2003). This enabled the researcher get extra information on determinants of social interaction and their effects on the learning of children living with autism in regular pre-schools in Nairobi County.

### 3.6.3 Focus Group Discussion

Focus group discussions were used to gather more information on determinants of social interaction and their effects on the learning of children living with autism from occupational therapists (appendix iii) and also parents (appendix iv). Focus group comprised of 6-8 individuals with some common characteristics, which are useful to the study. The discussion with the participants was done in a systematic way, that is, round the table and each session took around one hour with occupational therapist and half an hour with parents. This was to enable the researcher to obtain information on their opinion and ideas on this specific field of study, namely: determinants of social interaction and their effects on the learning of children living with autism regular pre-schools in Nairobi County.

### 3.7 Pilot Study

A pilot study was done before the actual study was undertaken in one school that integrates children living with autism. This was to check whether the instruments were providing the information they were meant to gather. Each research instrument underwent a piloting procedure. The researcher visited the school and briefed the participants on the reason for data collection in their school. The researcher believed that the sample which was used in the pilot study has the same properties as the one that which was used in the main study. The Pilot study provided a chance for the researcher to note any weakness in the instruments for rectification. The pilot school was exempted from the main study.
3.7.1 Validity

Validity is the extent to which an instrument measures what it is supposed to measure (Kothari, 2008; Orodho, 2004). The study used content validity to establish the validity of the questionnaire which was used to measure quantitative data. The researcher used external audit validity whereby experts in the area of study examined the validity of the interview schedule and focused group discussions which were used to measure qualitative data. Also data triangulation validity was used because multiple research tools were used to help understand the content of the tools.

The validity of the research tools in this study namely questionnaires, interview schedules and focused group discussion schedules was achieved by making sure that the content in the research instruments correlate with the study objectives. The instruments were pre-tested before the main study through the pilot study. Validity was also ensured by comparing comments from the key experts in the area of study. Their comments, observations and recommendations were incorporated in the final questionnaire, semi-structured interview schedule and focused group discussion schedule.

3.7.2 Reliability

Reliability is a measure of the degree to which a research instrument yields same findings after it is administered many times (Orodho, 2003). The study used split half method to ensure reliability. This method of assessing reliability of data involves administering the instrument to the participants once and then splitting the questionnaire items into two (Mugenda and Mugenda, 2003). The scores obtained in the first and the second halves were correlated to establish the extent to which the content of the questionnaires were consistent in eliciting the same responses. After correlation, ambiguous questions were removed and moderations done.
To compare the results of the two halves for reliability, Spearman correlation product moment formula was employed to compute the correlation coefficient in order to establish the extent to which the content of the questionnaires were reliable in eliciting consistent. Spearman Correlation Coefficient of $r = 0.850$ was found to be significant at $\alpha = 0.05$ ($P=0.021$).

### 3.8 Data Collection Techniques

The first step in data collection was to seek audience with headteachers by issuing them an introductory letter which briefed them about the study and also sought consent to carry out the study in their schools. The questionnaires were distributed to the participants to fill and were returned after a week. Face-to-face interviews were held with each of the headteacher separately at his/her convenient time in his/her office on separate days. A letter of introduction was done to the parents and was sent through the schools headteachers requesting them to attend a discussion with the researcher. Focus group discussions with occupation therapists and parents were conducted in each school in a round table but in separate sessions of each group to verify the information in the content of questionnaires and interviews.

### 3.9 Data Analysis

The data was coded according to themes which emanated from the research objectives and questions. The coded data was analyzed using both qualitative and quantitative techniques. The quantitative data was analyzed and presented using descriptive statistics such as frequency distribution tables, graphs and percentages. Qualitative data was presented in narrative form.
3.10 Logistic and Ethical Considerations

The researcher obtained authorization letter from Graduate School, Kenyatta University and permit from the National Commission for Science, Technology and Innovation (NACOSTI). The researcher presented the permit to Nairobi County Director of Education and Sub-County Directors. The researcher sought for permission from the headteachers of the three schools to be able to collect data from their Schools. The researcher explained to the participants the purpose of the study and requested their willingness to participate in it. Participants were assured that the information that was gathered from this study was only for academic purpose and therefore it was treated as private and confidential and solely for this study.
CHAPTER FOUR
DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents the results of the study and discussion of the study findings. The purpose of the study was to establish social interaction and its implications on learning of Children living with autism in regular pre-schools in Nairobi County, Kenya. The study findings presented are based on the following research objectives.

a) To establish the prevalence of children living with autism in regular pre-schools that integrates children of different disabilities.

b) To find out the influence of pre-school’s existing culture on learning of children living with autism in regular pre-schools.

c) To establish the influence of nature of training of pre-school teachers on learning of children living with autism in a regular pre-school.

d) To examine the influence of diet of children living with autism on their learning in a regular pre-school.

e) To determine whether there is a significant relationship between social interaction of children living with autism and their learning.

f) To establish whether there is a significant relationship between the attitude of teachers on children living with autism learning in regular pre-schools
4.2 Demographic Information

In order to have a feel of the sampled teachers and teacher assistants, their demographic information of the participants was sought and it was discussed under the following subheadings: gender, age, nature of training and teaching experience.

4.2.1 General Information

In this study, the sample size was 111 respondents, 12 occupational therapists and 20 parents were available for focused group discussion, 3 headteachers were available for interviews, 56 teachers and teacher assistants filled in the questionnaires and returned. The study findings revealed that out of a sample of 111 respondents, 92 responded. This represented 82.9% response rate. According to Babbie (2002), any response of 50% and above is adequate for analysis, thus 82.9% was very good response rate.

4.2.2 Gender of headteachers, occupational therapist and parents

![Figure 4.1: Gender of headteachers, occupational therapists and parents](image)

Figure 4.1: Gender of headteachers, occupational therapists and parents
The finding from the figure 4.1 shows that 8(66.7%) of occupational therapists were male while 4(33.3%) were female. Among the parents, three quarters were female while the rest were male. Lastly 2(66.7%) of the headteachers were female while only one of them 1(33.3%) was male.

4.2.3 Ages of headteachers, occupational therapist and parents

![Chart showing ages of headteachers, occupational therapists and parents]

**Figure 4.2: Ages of headteachers, occupational therapists and parents**

From the findings in figure 4.2 it shows more than half of occupational therapists were aged between 31-40 years while the minorities were those aged between 20-30 years. Headteachers were aged between 46 years and above with majority being those aged between 46-50 years. Also the parents aged between 31-40 years were half with minorities being those aged between 20-30 years.
4.2.4 Gender of the teachers and teachers’ assistants

The findings from the figure 4.3 shows that from the data collected among the male, 4(7.1%) were special need teachers, 10(17.9%) were regular teachers and 2(3.6%) were teachers assistants totaling to 16(28.6%). Among the female, 13(23.2%) were special need teachers, 8(14.3%) were regular teachers and 19(33.9%) were teacher assistants. This shows that majority of teachers and teacher assistants were female. These findings concur with McDougall, Dewit, King, Miller, and Killip (2004) who found that females had slightly more positive attitudes than did males towards children with disabilities. Thus they are majority in this study.
4.2.5 Teachers’ and Teachers’ Assistants Age

Figure 4.4 shows that majority of the special need teachers sampled were aged between 31-40 years, 7(12.5%) while minorities were aged between 46-50 years, 2(3.6%). Among the regular teachers majority were aged between 41-45 years, 10(17.9%) while the least number were those aged between 31-40 years, 1(1.8%). The teacher assistants aged between 20-30 years and 31-40 years tied with 9(16.1%) while the minorities were aged between 41-50 years, 3(5.4%). None of the teachers and teacher assistants was aged above 50 years. This indicates that majority of teachers and teacher assistants were aged below 45 years.
4.2.6 Nature of Professional Training

Figure 4.5 shows that teachers who have undergone Special Needs Education training were 17(30.4%), regular trained teachers were 18(32.1%) and lastly teacher assistants were 21(37.5%). According to the interview carried out with the headteachers, they indicated that teacher’s assistants are majority in their schools and this is attributed to the fact that autistic children require a lot of care and monitoring.
4.2.7 Teaching Experience of Teachers and their Assistants

Teaching experience is presented in figure 4.4

Figure 4.6: Teaching Experience

Figure 4.6 shows that those who had 1 to 5 years teaching experience were 8(14.3%) special need education teachers and 12(21.4%) teacher assistants. Among those who had worked for 5 to 10 years 5(8.9%) were special need education teachers, 2(3.6%) were regular teachers and 7(12.5%) were teacher assistants. Lastly, those who had more than 10 years’ experience 4(7.1%) were special need teachers, 16(28.6%) were regular teachers and 2(3.6%) were teacher assistants. This indicates that most experienced teachers in terms of years in the profession were regular teachers, followed by special need education teachers. In an effort to determine determinants of social interaction and their effects on the learning of children living with autism in regular pre-school, the
participants were asked to state their level of agreement on various factors. A four Likert scale was used to interpret the participants’ response.

4.3 Prevalence of Autism

The first task of this study as per objective number one was to investigate the prevalence of autism in Nairobi County. From the interviews with the three headteachers of the three sampled pre-schools in Nairobi County, it showed that the prevalence of autism in regular preschools in Nairobi County is currently at 5.2%. In one of the schools, the headteacher indicated that there are 610 pre-schoolers and among them 30 cases were children living with autism resulting to 31.6% prevalence of autism. The other two headteachers indicated that they had 705 and 520 pre-schoolers respectively. They also reported that they had 40 and 25 cases of autism, resulting into 42.1% and 26.3% prevalence of autism respectively.

Figure 4.7: Prevalence of Autism in the three Preschools
4.4 Pre-school Existing Culture

The second task of this study was to investigate whether various factors on pre-schools existing culture play any role in influencing learning of children living with autism. The teachers and teacher’s assistants were asked about the extent of their agreement on various factors in their questionnaire. Also, the headteachers were interviewed on the same.

Table 4.1 Pre-school Existing Culture

<table>
<thead>
<tr>
<th>Pre-school Existing culture</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>My school has modified existing systems to cater for children living with autism</td>
<td>4 (7.1%)</td>
<td>9 (16.1%)</td>
<td>28 (50.0%)</td>
<td>15 (26.8%)</td>
</tr>
<tr>
<td>In classroom setting children living with autism are treated the same way as children leading normal life.</td>
<td>17 (30.4%)</td>
<td>18 (32.1%)</td>
<td>14 (25.0%)</td>
<td>7 (12.5%)</td>
</tr>
<tr>
<td>Teaching methods in classroom are varied to accommodate both children with and those without.</td>
<td>9 (16.1%)</td>
<td>6 (10.7%)</td>
<td>34 (60.7%)</td>
<td>7 (12.5%)</td>
</tr>
<tr>
<td>There are teachers specifically trained to cater for children living with autism in my school.</td>
<td>(7.1%)</td>
<td>10 (17.9%)</td>
<td>25 (44.6%)</td>
<td>17 (30.4%)</td>
</tr>
<tr>
<td>Children living with autism attend therapy session often.</td>
<td>7 (12.5%)</td>
<td>23 (41.1%)</td>
<td>26 (46.4%)</td>
<td></td>
</tr>
<tr>
<td>In my school there are adequate equipments for therapy sessions of children living with autism.</td>
<td>4 (7.1%)</td>
<td>12 (21.4%)</td>
<td>25 (44.6%)</td>
<td>15 (26.9%)</td>
</tr>
<tr>
<td>To enhance their social interaction children living with autism are taught other skills apart from academics.</td>
<td>2 (3.6%)</td>
<td>9 (16.1%)</td>
<td>23 (41.1%)</td>
<td>22 (39.3%)</td>
</tr>
</tbody>
</table>

From table 4.1, the result shows that some pre-school existing culture factors influences learning of children living with autism while other did not. Modification of the school
existing systems is one of the attributes influencing learning of children living with autism since there was an agreement of 76.8% by 43 teachers and teacher assistants, while 13(23.2%) felt that it does not affect. From the findings, it shows that modification of the pre-school existing culture influences learning of children living with autism.

Responses of 35(62.5%) of teachers and teacher assistants felt that children living with autism are treated the same as children leading normal life in a class setting while 21(37.5%) disagreed on the above. These findings differed with Hastings & Oakford (2003) whose study showed that student teachers had more negative attitudes towards students with behavioral and/or emotional challenges than towards students with cognitive difficulties including those with autism. Teaching methods was another factor that influences learning of AC because 43(73.2%) teachers and teacher assistants agreed while 15(26.8%) of them felt that teaching method has no effect on learning of children living with autism. Teachers’ training was another factor believed to influence learning of children living with autism because 42(75%) teacher and teachers assistants agreed, while 14(25%) disagreed. This concurs with Kyung-Hee (2008) who in his study found that training of teachers on naturalistic teaching strategies had influence on learning of children with disabilities in inclusive preschools.

Further analysis showed that 49(87.5%) teachers and teacher assistants agreed that attending therapy sessions influence learning of children living with autism but 7(12.5%) of them disagreed. They also believed that having adequate therapy equipment influences learning of children living with autism because 40(71.5%) teachers and teacher assistants agreed while 16(28.5%) disagreed. The teachers and teacher assistants also believed teaching children living with autism other skills apart from academics influences their
learning because 45(80.4%) of them agreed but 11(19.6%) felt that teaching children living with autism other skills does not enhance their learning.

In general, the participants agreed that pre-school existing culture influences learning of children living with autism. The study findings concurred with the study findings published in Journal of Autism by Attwood (2004) that children living with autism attending inclusive pre-schools had a greater improvement on cognitive test scores than those attending non-inclusive pre-schools. According to study findings from the interviews conducted with headteachers one of the headteacher said;

“In my school there was modification of the environment through construction of ramps to enhance mobility, children friendly toilets and bathrooms were built when we started inclusive education. Also, spacious classrooms were developed painted with child-friendly shades after inclusion of children living with autism in regular classes”.

These findings similarly concur with UNESCO (2004a, 2001) study findings which suggested that learners with disabilities have diverse needs and therefore the learning institution should make the environment accessible within the school to avoid excluding children with special needs from the institutions. To alleviate this problem, then, the environment should be adopted to suite the diverse learners needs. This involves organizing the classroom and the school compound to suit the needs of the children living with autism. Cheshire (2004) adds that physical modifications the school may include are; building ramps, constructing accessible toilets, building spacious classroom windows and painting walls, use of appropriate lighting and landscaping after inclusion of children living with autism.
4.5 Teacher Training

The third task of this study was to establish whether various factors on teachers’ training play any role in influencing learning of children living with autism in regular Pre-schools. Teachers and teachers’ assistants were asked about their extent of agreement on various factors on teachers’ training as pertains determinants of social interaction and their effects on learning of children living with autism in their questionnaire.

Table 4.2 Teachers’ Training

<table>
<thead>
<tr>
<th>Teachers’ Training</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>In my school there are adequate teachers who have undergone special education training</td>
<td>6 (10.7%)</td>
<td>19 (33.9%)</td>
<td>15 (26.8%)</td>
<td>16 (28.6%)</td>
</tr>
<tr>
<td>Teacher training matters a lot when it comes to handling of children living with autism</td>
<td>4 (7.1%)</td>
<td>3 (5.4%)</td>
<td>20 (35.7%)</td>
<td>29 (51.8%)</td>
</tr>
<tr>
<td>Teachers who have special education training handle children living with autism better than those with only regular training</td>
<td>4 (13%)</td>
<td>13 (23.2%)</td>
<td>16 (28.6%)</td>
<td>23 (41.1%)</td>
</tr>
<tr>
<td>In my school there are teachers specifically trained to handle children living with autism</td>
<td>11 (19.6%)</td>
<td>11 (19.6%)</td>
<td>17 (30.4%)</td>
<td>17 (30.4%)</td>
</tr>
<tr>
<td>I learnt about autism in college</td>
<td>8 (14.3%)</td>
<td>18 (32.1%)</td>
<td>13 (23.2%)</td>
<td>17 (30.4%)</td>
</tr>
<tr>
<td>My training covered all methods of teaching children living with autism that can enhance their learning</td>
<td>6 (10.7%)</td>
<td>21 (37.5%)</td>
<td>23 (41.1%)</td>
<td>6 (10.7%)</td>
</tr>
</tbody>
</table>

From the table 4.2 the identified teacher training attributes influence learning of children living with autism. The 31 (55.4%) of the teachers and teachers’ assistants agreed that availability of enough trained teachers in special Need Education influences learning of children living with autism in a regular school setting while 25(44.6%) of them disagreed.
Majority of the teachers and teacher assistants, 49(87.5%) agreed that teachers’ training matters a lot when it comes to handling of children living with autism and this influences their learning while 7(12.5%) of them differed. Also 30(53.6%) of teachers and teachers’ assistants agreed that if one had learnt about autism in college he/she could handle children living with autism better and this influences learning of children living with autism thus while 26(46.4%) of them disagreed.

The 29(51.8%) teachers and teachers’ assistants further agreed that those teachers who had learnt teaching methods of children living with autism could handle them well and this influences their learning but there was disagreement from 27(48.2%) of the participants. In general, the participants agreed that teachers’ training influences learning of children living with autism. The above findings concurred with the findings of the interview carried out with headteachers, where majority emphasized that teachers having SNE handles children living with autism better than those who have not undergone SNE training.

Furthermore the study findings concur with Mwakalinga (2012) who carried out a study to explore how teachers influence the enhancement of social interaction for learners with ASD. The study findings showed that teachers play a major role in the enhancement of learning of a child and can stimulate positive environment for relationship and social interaction, regardless of all difficulties they are encountering. Based on the study findings the researcher suggested that teachers should get more knowledge on ASD and the government and other stakeholders should give economic and material support for education of children living with autism. The researcher also recommended more research
should be done on requirements of children living with autism in order to equip teachers in inclusive schools with the knowledge and skills of handling children with Autism.

4.6 Diet of Children Living with Autism

The fourth task of this study was to examine whether various factors on diet of children living with autism have influence on their learning.

Table 4.3 Diet of children living with autism

<table>
<thead>
<tr>
<th>Diet of children living with Autism</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know what diet intervention of children living with autism is.</td>
<td>3(5.4%)</td>
<td>8(14.3 %)</td>
<td>26(46.4%)</td>
<td>19(33.9%)</td>
</tr>
<tr>
<td>Casein in milk affects brain of children living with autism.</td>
<td>8(14.3%)</td>
<td>2 (3.6%)</td>
<td>28(50.0%)</td>
<td>18(32.1%)</td>
</tr>
<tr>
<td>Gluten in wheat affects brain of children living with autism.</td>
<td>4 (7.1%)</td>
<td>6 (10.7%)</td>
<td>29(51.8%)</td>
<td>17(30.4%)</td>
</tr>
<tr>
<td>I have witnessed a child with autism who is hyperactive because of eating sugary foods.</td>
<td>6(10.7%)</td>
<td>2 (3.6 %)</td>
<td>23(41.1%)</td>
<td>25(44.6%)</td>
</tr>
<tr>
<td>I have learnt that foods containing salicylates such as grapes, lemon, limes, kiwis etc. affects brain of children living with autism.</td>
<td>4 (7.1%)</td>
<td>7 (12.5%)</td>
<td>32(57.1%)</td>
<td>13(23.2%)</td>
</tr>
<tr>
<td>When sugary foods are removed from children living with autism diet they become calm and can interact with other children well.</td>
<td>4 (7.1%)</td>
<td>4 (7.1%)</td>
<td>31(55.4%)</td>
<td>15(96.4%)</td>
</tr>
<tr>
<td>If gluten and casein are withdrawn from children living with autism diet they can improve in their brain development thus enhancing their learning.</td>
<td>6(10.7%)</td>
<td>2 (3.6%)</td>
<td>29(51.8%)</td>
<td>19(33.9%)</td>
</tr>
<tr>
<td>I recommend parents to practice diet intervention for their children living with autism.</td>
<td>4 (7.1%)</td>
<td>1 (1.8%)</td>
<td>25(44.6%)</td>
<td>26(46.4%)</td>
</tr>
</tbody>
</table>

From the table 4.3 the findings shows that there was an agreement from 45(80.3%) teachers and teachers’ assistants that they are aware of what diet intervention is but 11(19.7%) of them disagreed. The findings showed that casein in milk affects the brain of children living with autism and this influences their learning because 46(82.1%)
teachers and teachers’ assistants agreed while 10(17.9%) disagreed. Among the participants 46(82.1%) of them further agreed that gluten in wheat affects brain of children living with autism and this influences their learning while 10(17.9%) of them differed. From the response of 48(85.7%) teachers and teachers’ assistants it was noted that children living with autism become hyperactive when they eat sugary foods and this influences their learning. Also 45(80.4%) teachers and teachers’ assistants agreed that foods containing salicylates for example kiwi affects the brain of children living with autism and this influences their learning while 11(19.6%) of them disagreed.

Further analysis showed that 48(85.8%) of the participants agreed that when sugary foods are removed from children living with autism diet they become calm and this enhances their learning while 8(14.2%) of them differed. Other findings showed that 48(85.7%) of the teachers and teacher assistants agreed that when foods containing gluten and casein are removed from children living with autism diet, they improve in brain development and this enhance their learning but 8(14.3%) differed. It was also established that 51(91.0%) of the teachers and teachers assistants agreed that they can recommend to parents having children living with autism to practice diet intervention but 5(8.9%) felt that it was not necessary. During the interviews with one of the headteachers he expressed his opinion and said;

“We give special diet to our pupils with autism because foods containing a lot of sugar, gluten and casein affect them. This has forced us to charge parents of children living with autism extra money to cater for their children’s nutrition.”

According to the findings from the FGD carried out with parents having AC, diet influences how children living with autism relate with other people and ultimately their learning. Many parents pointed out that their children living with autism become hyperactive when they feed on sugary foods and this influences social interaction of
children living with autism thus affecting their learning. Some parents pointed out that at some point in life their children living with autism had a problem in their speech, coordination of some daily activities especially when they feed on foods containing casein and gluten. One of the parents said:

“When my daughter eats some fruits especially pineapple she becomes so hyperactive. I avoid giving her any wheat and milk products because once she takes them she becomes so violent”

4.7 Social Interaction

The fifth task of this study was to find out whether social interaction of children living with autism affects their learning in regular pre-schools. Regression was used to determine relationship between social interactions of children living with autism and their learning. Thus the null hypothesis being tested was;

\[ H_0 \] There is no significant relationship between social interactions of children living with autism and their learning.

Table 4.4 Social Interaction

Model Summary

<table>
<thead>
<tr>
<th>Mode</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.971(a)</td>
<td>.942</td>
<td>.941</td>
<td>1.410</td>
</tr>
</tbody>
</table>

a) Predictors: (Constant), SOCIAL INTERACTION

The model summary table 4.4 provides the R and R- square values. The R-value represents the simple correlation and it is 0.971 which indicates a high degree of correlation. The R- squared value (0.942) indicates the total variation in the dependent variable (learning) can be explained by independent variable (determinants of social interaction and their effects). It shows that 94.2% of learning of children living with
autism can be explained by determinants of social interaction and their effects and therefore this leaves only 5.8% unexplained. These findings concur with FGD carried with both parents and occupational therapists, who cited that learning of children living with autism is affected by their character as pertains social interaction like excluding themselves, not initiating foreplay and if they socially interact they do it in a very odd manner for example hugging and kissing in an extraordinarily manner.

Table 4.5 Anova table

Anova

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>1745.192</td>
<td>1</td>
<td>1745.192</td>
<td>877.782</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>107.362</td>
<td>54</td>
<td>1.988</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1852.554</td>
<td>55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a) Predictors: (Constant), SOCIAL INTERACTION
b) Dependent Variable: LEARNING

The anova table reports how well the regression equation fits the data. It predicts whether the dependent variable (learning) is statistically significance to social interaction. (P > 0.05, α = 0.05). This shows that social interaction predicts learning. This concurs with the study findings children living with autism have challenges in making friends in school, like excluding themselves from playgroups, have difficulty forming relationships and like to have friends but are unable to make friends are some of the social interaction factors that influence learning of autistic children. Therefore there is relationship between social interaction and learning of children living with autism. Thus, the null hypothesis is rejected.

These findings also concurred with Ngungu (2005) who felt that autism characteristics such as are appearing sensitive to human contact, demonstrating attachment and affection towards those they are familiar to and sometimes expressed to strangers, though it is
usually demonstrated in an odd, inappropriate way, such as hugging at regular intervals, withdrawal and may not even respond to their names, greatly affect their learning.

**Table 4.6 of Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant) -1.162</td>
<td>.703</td>
<td>-1.652</td>
<td>.104</td>
</tr>
<tr>
<td></td>
<td>TOTSEFI .994</td>
<td>.034</td>
<td>.971</td>
<td>29.627</td>
</tr>
</tbody>
</table>

a) Dependent Variable: LEARNING

The coefficients table 4.6 provides us with necessary information to predict how learning of children living with autism is influenced by their social interaction. The regression equation is therefore is;

**Learning = -1.162 + 0.904 (social interaction)**

**L = -1.162 + 0.994SI**

Where L stands for Learning and SI stands for social interaction

This indicates in absence of social interaction learning will be negative by -1.162. Change in social interaction is by 0.994. From the regression equation learning is positive only when social interaction is positive. When social interaction is negative, learning is also negative. This implies that there is relationship between social interaction and learning.

4.8 **Attitude of Teachers towards Children Living with Autism**

The sixth task of this study was to investigate whether attitudes of teachers play any role in influencing learning of children living with autism in regular pre-schools. This variable was analyzed using frequencies, percentages. Simple regression was also used. The null hypothesis being tested was;
There is no significant relationship between the attitude of teachers towards children living with autism learning.

Table 4.7 Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.849(a)</td>
<td>.721</td>
<td>.716</td>
<td>3.094</td>
</tr>
</tbody>
</table>

a) Predictors: (Constant), Attitude of Teachers and Non-Autistic Children

The model summary table 4.8 provides R and R-square values. The R-value represents the simple correlation and it is 0.849 which indicates a high degree of correlation. The R-square value (0.721) indicates how much of the total variation in the dependent variable (learning) can be explained by independent variable (determinants of social interaction and their effects). It shows that 84.9% of learning of children living with autism can be explained by determinants of social interaction and their effects and this leaves only 14.1% unexplained. These concur with McLeskey & Waldron (2002) study findings that indicates that inclusive school setting can only succeed if teachers have positive attitude and there are support system in place such as co-operation between special need education teachers and regular education teachers, sensitization of children leading normal life on behavior of children living with autism and how to take care of them, benchmarking, team and parallel teaching and teachers’ training and workshops.

Table 4.8 Anova Table

Anova

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>1335.715</td>
<td>1</td>
<td>1335.715</td>
<td>139.557</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>516.838</td>
<td>54</td>
<td>9.571</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1852.554</td>
<td>55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a) Predictors: (Constant), Attitude of Teachers
b) Dependent Variable: Learning
The Anova table reports how well the regression equation fits the data. It predicts that dependent variable is statistically significance to independent variable. (P < 0.05, $\alpha=0.05$). In this case $p=0.000$, therefore attitude of teachers towards children living with autism is statistically significance to learning. Thus the null hypothesis is rejected. These findings concur with Mushoriwa (2001) who suggested that before implementation of special education programme for learners with special needs within regular schools, it is vital to investigate the attitude of the school administrators, teachers and children leading normal life towards children with disability because attitudes are the greatest obstacle or the greatest assets to the development of inclusive education. This concurs with the findings because the attitude in this case refers desires, convictions, feelings, opinions, beliefs, hopes, judgments and sentiments.

Table 4.10 Coefficient table

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>-1.482</td>
<td>1.775</td>
</tr>
<tr>
<td>TOTAL SG</td>
<td>.956</td>
<td>.081</td>
</tr>
</tbody>
</table>

a) Dependent Variable: LEARNING

The coefficients table provides us with necessary information to predict the relationship between learning of children living with autism and their social interaction. The regression equation therefore is:

Learning = -1.482 + 0.956(social interaction)

$L = -1.482+ 0.956SI$

Where $L$ stands for Learning and $SI$ stands for social interaction.
This indicates in absence of social interaction learning will be negative by -1.482 and change in social interaction is by 0.956. From the regression equation learning is positive only when social interaction is positive. When social interaction is negative, learning is also negative. This implies that there is relationship between social interaction and learning. Thus the null hypothesis is rejected.

Table 4.11 Attitude of Teachers towards Children Living with Autism

<table>
<thead>
<tr>
<th>Attitude of teachers and towards AC</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers have negative attitude towards pupils with disabilities than those without</td>
<td>19 (33.9%)</td>
<td>18 (32.1%)</td>
<td>17 (30.5%)</td>
<td>2 (3.6%)</td>
</tr>
<tr>
<td>Teachers and refer children living with autism as special children even in their presence.</td>
<td>14 (25.0%)</td>
<td>8 (14.3%)</td>
<td>23 (41.1%)</td>
<td>11 (19.6%)</td>
</tr>
<tr>
<td>Children leading normal life prefer to play with children without either physical or intellectual challenges.</td>
<td>5 (8.9%)</td>
<td>20 (35.7%)</td>
<td>25 (44.6%)</td>
<td>6 (10.7%)</td>
</tr>
<tr>
<td>I have positive attitude towards children living with autism.</td>
<td>8 (14.3%)</td>
<td>4 (7.1%)</td>
<td>26 (46.4%)</td>
<td>18 (32.1%)</td>
</tr>
<tr>
<td>Female teachers have slightly more positive attitude towards children living with autism than male teachers.</td>
<td>10 (17.9%)</td>
<td>15 (26.8%)</td>
<td>16 (28.6%)</td>
<td>15 (26.8%)</td>
</tr>
<tr>
<td>Teachers want children leading normal life to help children living with autism in most school activities e.g. wiping the desk.</td>
<td>3 (5.4 %)</td>
<td>8 (14.3 %)</td>
<td>37 (66.1%)</td>
<td>8 (14.3%)</td>
</tr>
</tbody>
</table>

From the table 4.7 above the findings shows that 19(34.1%) participants agreed that teachers have negative attitude towards pupils with disabilities than those without while 37(65.0%) teachers and teachers’ assistants disagreed. This concurred with Milson (2006) in his research study on Creating Positive School Experiences for Students with Disabilities whose purpose was to investigate the attitude of regular students and teachers on persons living with disabilities and found that students and teachers possessed somewhat negative attitudes toward students with disabilities and viewed persons with disabilities as different from and inferior to persons without disabilities. Also 34(60.7%)
teachers and teachers’ assistants agreed that teachers refer autistic children as special children even in their presence and this influences their learning but 22(39.3%) of them differed.

There was agreement by 31(55.3%) teachers and teachers’ assistant that children leading normal life prefer to play with children without either physical or intellectual challenges and this influences learning of children leading normal life, however almost half 25(44.6%) of them disagreed. Further 44(78.5%) teachers and teachers’ assistants reported that they have positive attitude towards children living with autism while less than a quarter of them felt that they have negative attitude. It was also reported female teachers had slightly higher positive attitude towards autistic children than male counterparts and this influences their learning because there was agreement from 31(55.3%) of teachers and teachers’ assistants but there was disagreement of the same from 25(44.7%) of them.

It was also noted that the 45(80.4%) of the teachers and teacher assistants agreed that non-autistic children endeavor to help autistic children in most school activities for example wiping the desk, cleaning the classroom among other activities and this influences social interaction of AC thus affecting their learning but less than a quarter differed.

The above findings concurred with FGD with occupational therapists where one therapist confirmed that;

“Some teachers and NAC have negative attitude towards AC. Some NAC call AC names e.g. ‘watoto wa kuzungukazunguka na kuchekacheka’ meaning kids who loiter and giggle aimlessly. My suggestion is, there should be training of both teachers and non-autistic children on how to handle autistic children”
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the key findings, conclusions and recommendations based on the findings. The conclusions and recommendations drawn, focused on addressing the general objective of the study. Finally recommendations for further studies are presented.

5.2 Summary of Findings

The general objective of the study was to investigate determinants of social interaction and their effects on the learning of children living with autism in regular pre-schools in Nairobi County. The specific objectives of the study were; to establish the prevalence of children living with autism in regular pre-schools that integrates children of different disabilities; to find out the influence of pre-school’s existing culture on learning of children living with autism in regular pre-schools; to establish the influence of nature of training of pre-school teachers on learning of children living with autism in a regular pre-school; to examine the influence of diet of children living with autism on their learning in a regular pre-school; to determine whether there is a significant relationship between social interaction of children living with autism and their learning and to establish whether there is a significant relationship between the attitude of teachers on children living with autism learning in regular pre-schools.
5.3 Conclusions

The conclusions were based on the following objectives and findings of the study:

a) To establish the prevalence of children living with autism in regular pre-schools that integrates children of different disabilities.

b) To find out the influence of pre-school’s existing culture on learning of children living with autism in regular pre-schools.

c) To establish the influence of nature of training of pre-school teachers on learning of children living with autism in a regular pre-school.

d) To examine the influence of diet of children living with autism on their learning in a regular pre-school.

e) To determine whether there is a significant relationship between social interaction of children living with autism and their learning.

f) To establish whether there is a significant relationship between the attitudes of teachers on children living with autism learning in regular pre-schools.

Firstly, based on the study findings it is logical to say that the trend in prevalence of autism in regular schools practicing inclusive education in Nairobi County was on an upward trend. This is because in the year 2003 it was at 4% but currently it is at 5.2%. This could be due to the autism awareness in the country.

Secondly, based on the study findings it is logical to conclude that pre-school existing culture has influence on social interaction of children living with autism thus affecting their learning. Therefore schools practicing inclusive education should have their systems modified so as to enhance social interaction of children living with autism inorder to improve their learning. The study findings showed in a classroom setting children living
with autism are treated differently from children leading normal life. Therefore the administrators together and teachers should involve both children living with autism and children leading normal life in school activities where applicable. Teaching methods is another factor that affect learning of children living with autism, therefore the curriculum should be modified to such that it caters for needs of both children living with autism and children leading normal life. Teachers who had undergone special needs education were found to handle children living with autism better, thus in-servicing of teachers should be gone regularly so as to enhance the skills of also regular teachers.

Therapy is very vital for children with special needs and especially children living with autism because it calms hyperactivity thus it influences their learning. This implies that schools having placement of children with autism in regular classes should be well equipped with therapy equipments and trained occupational therapists. Teaching children living autism other skills such daily living skills apart from academics influence their learning and therefore other skills are important to enable them live a holistic life. Teacher-learner ratio is another factor that influences learning of children living with autism and therefore in an inclusive school there should be enough teachers to ensure teacher-learner ratio is catered for. In general the respondents agreed that pre-school existing culture influences learning of children living with autism.

Thirdly, the identified teachers’ training attributes influences learning of children with autism. The respondents agreed that availability of enough trained teachers in Special Need Education influences learning of children living with autism positively. Therefore every school practicing inclusive education should ensure that there are enough SNE teachers in the school. Teachers who had learnt autism in college could handle children
living with autism better and this influence their learning positively. Thus if teachers in inclusive schools had not learnt about autism in college during their training the government should organize for their in-servicing so as to know how handle pupils having the condition. In general the teachers’ training was found to influence learning of children living with autism.

Fourthly, all the identified factors on diet were found to influence learning of children living with autism. Diet intervention is important to ensure that social interaction of children with autism is enhanced thus improving their learning. Casein in milk and gluten in wheat affects the brain of children living with autism to a great extent and this influences learning of children living with autism. Therefore these foods should be eliminated from their diet. Children living autism become hyperactive when they eat food with sugar and this greatly influences their learning. Thus foods with sugar should be eliminated from their diet. Foods containing salicylates for example kiwi affects their brain and this affects their learning. This implies that foods with sugar, wheat and milk should be eliminated from their diet. In general diet intervention should be recommended to parents with children living with autism.

Fifthly, children living with autism have challenges in making friends in school and this affects their learning. Children living with autism do not find social interaction enjoyable and this negatively affects their learning. In addition children living with autism do not initiate positive interaction with their classmates and this influences their learning. The children living with autism like excluding themselves from playgroups and this greatly affects their learning. It has been established that children living with autism have difficulty forming relationships and this negatively influences their learning. Also
children living with autism do not initiate imaginative plays and this affects their learning. The children living with autism likes to have friends but are unable to make friends and this negatively affects their learning. Therefore social interaction greatly affects learning of children living with autism.

Lastly, the attitude of teachers towards children living with autism influences their learning. Teachers treat children living with autism in a special way and this makes them feel inadequate and negatively affects their learning. The teachers refer children living with autism as special children even in their presence and this affects their learning. Children leading normal life prefer to play with children without either physical or intellectual challenges and this affects learning of children living with autism. Female teachers have slightly higher positive attitude towards children living with autism than male counterparts and this positively influences their learning. Male teachers should be sensitized on how to handle special need pupils and especially those living with autism. Teachers have negative attitude towards pupils with disabilities as compared to those without and this affects their learning. Generally teachers should sensitized on how to handle children living with autism.

Children leading normal life demonstrate their willingness to help children living with autism in most of school activities for example wiping the desk, cleaning the classroom among other activities and this demean children living with autism and affecting their learning. As for the teachers they prefer working with children leading normal life rather than children with autism and this affecting their learning. To some extent children living with autism should be allowed to do some activities for example cleaning the classroom this raises their self-esteem and this will positively influence their learning. In general,
attitude of teachers towards children living with autism influences learning children with autism either positively or negatively.

5.4 Recommendations

Based on the findings and the conclusions of the study, the following recommendations were made in order to ensure there is effective social interaction of children living with autism in regular pre-schools and thus boosting their learning.

5.4.1 Policy Recommendations

i. National Special Need Education Policy (2010) advocated for inclusive education for persons living with disabilities. The major objectives of this policy as pertains to inclusive education is, promotion of inclusive placement for children with special needs in both formal and non-formal education and training and having a barrier free environment in all learning institutions. According to the study findings teachers had negative attitude towards children living with autism. Thus this policy should be enhanced by ensuring that after inclusion of children living with autism in regular classes measures are put in place to ensure that they are mingling well with both teachers and children leading normal life.

ii. In regular classes there are both regular teachers and special needs teachers handling both pupils with disabilities and those without; therefore the government should come up with a policy that advocates for training of both teachers and children leading normal life on how to handle children living with autism.
iii. Since diet of children living with autism was found to influence their learning, the
government should come up with a policy advocating for training of nutritionists
on diet of the children living with autism. Also in the same policy government
should come up with measures on how to have forums where parents, teacher and
caregivers handling children living with autism are sensitized on diet intervention.

5.4.2 Recommendations for further Research

The present study focused on the determinants of social interaction and their effects on
learning of children living with autism in regular pre-schools in Nairobi County. The
following are recommendations for further researches in the area of concluded study;

i. A study could be carried out to investigate how parents with children living with
   autism socially interact with these children.

ii. Further research could be carried out to investigate how regular teachers and
    special needs teachers work together to handle children living with autism in
    regular classes.

iii. Another study could be carried out to investigate challenges faced by children
    living with autism in regular classes.

iv. A research study could be carried out to determine attitude of the administrators
    on placement of children living with autism in regular classes.
REFERENCES


Mannion, A., Leader, G, and Healy, O. (2013). *Analysis of the Predictors of Comorbid*


*Psychopathology, Gastrointestinal Symptoms and Epilepsy in Children and Adolescents with Autism Spectrum Disorder.*


Appendix i: Questionnaire for teachers and teacher assistants

INSTRUCTIONS:

Please indicate the most appropriate choice of answer by putting a tick in the brackets provided.

SECTION A: PERSONAL INFORMATION

1. Gender
   Male (   )            Female (   )

2. Age
   20-30(   )    31-40(   )    41-45(   )    46-50(   )    above 50(   )

3. Indicate the type of training you have undergone
   a) Special Education (   )
   b) Regular Training (   )
   c) Teacher Assistant (   )
   d) None of the above (   )

4. For how long have you been in the teaching profession?
   a) 1-5 years (   )
   b) 5-10 years (   )
   c) More than 10 years (   )

INSTRUCTIONS:
Please read each of the following statements carefully and for each item, think about your beliefs regarding social interaction and its implications on the learning of the autistic children in regular preschools. Please indicate on the Likert scale below the extent to which you agree with the following statements. Note there is no right or wrong answer.

**SECTION B: PRESCHOOL EXISTING CULTURE**

**Direction: Strongly Disagree (SD), Disagree (D), Agree (A), Strongly Agree (SA)**

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>My school has modified existing systems to cater for children living with autism.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>In classroom setting children living with autism are treated the same way as non-autistic children</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>In a classroom teaching methods are varied to accommodate both children living with autism and children leading normal life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>In my school there are teachers specifically trained to cater for children living with autism.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Children living with autism attend therapy session often.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>In my school there adequate equipment for children living with autism therapy sessions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>To enhance their social interaction children living with autism are taught other skills apart from academics.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Are there changes made in your school after inclusion of autistic children in regular classes to enhance their learning? YES ( ) NO ( )
If yes, which changes?
..............................................................................................................................................................................

2. Do you have some measures you would recommend to your school to take to enhance learning of children living with autism? YES ( ) NO ( )
If yes, explain briefly............................................................................................................................................................

**SECTION C: TEACHERS TRAINING**

**Direction: Strongly Disagree (SD), Disagree (D) Agree (A) (Strongly Agree (SA))**

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
</table>

76
1. In my school there are adequate teachers who have undergone special education training.

2. Teachers training matters a lot when it comes to handling of children living with autism.

3. Teachers who have special education training handle children living with autism better than those who have not.

4. In my school there are teachers specifically trained to handle children.

5. According to my training I’m competent to handle children living with autism.

6. I learnt about autism in college

7. My training covered all teaching methods of children living with autism that can enhance their learning.

---

1. Does teachers’ training affect learning of children living with autism? YES ( ) NO ( )

   If no explain briefly………………………………………………………………………………

   ………………………………………………………………………………………………………

2. Do have any advice to the government on in servicing of the teachers in preschools enhance learning of children living with autism? YES ( ) NO ( )

   If yes, explain briefly………………………………………………………………………………

   ………………………………………………………………………………………………………

---

**SECTION D: DIET**

**Direction: Strongly Disagree (SD), Disagree (D), Agree (A), Strongly Agree (SA)**

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I know what is meant of diet intervention of children living</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
with autism.


4. I have witnessed a child with autism who is hyperactive because of eating food with sugar.

5. I have learnt that foods containing salicylates such as grapes, lemon, limes, kiwis etc. affect children living with autism brain.

6. When foods with sugar are removed from diet of children living with autism they become calm and can interact with other children well.

7. If gluten and casein is withdraw from children living with autism diet they improve on their learning.

8. I recommend parents to practice diet intervention for their children living with autism.

1. Does the diet of children living with autism affect their social interaction?

YES (   )       NO (   )

If yes explain briefly……………………………………………………………………………………………

……………………………………………………………………………………………

……………………………………………………………………………………………

2. Do you have any advice on diet which you can give the parents having children living with autism?   YES (   )       NO (   )

If yes explain briefly……………………………………………………………………………………………

……………………………………………………………………………………………

……………………………………………………………………………………………

SECTION F: SOCIAL INTERACTION

Direction: Strongly Disagree (SD), Disagree (D), Agree (A), Strongly Agree (SA)

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
</table>

78
1. Children living with autism have challenges in making friends.

2. Children living with autism do not find social interaction enjoyable.

3. Children living with autism do not initiate positive interaction with their classmates.

4. Children living with autism like excluding themselves from playgroups.

5. Children living with autism do not initiate an imaginative play.

6. Children living with autism like to have friends but are unable to make friends.

1. Do you know any other autism characteristics which affect their social interaction thus affecting their learning? YES (    )                NO (   )
   If yes which ones? ...................................................................................................................

2. Is there ways autism characteristics can be curbed? YES ( )      NO ( )
   If yes, how? ............................................................................................................................

SECTION G: ATTITUDE OF TEACHERS TOWARDS CHILDREN LIVING WITH AUTISM

Direction: Strongly Disagree (SD), Disagree (D), Agree (A), Strongly Agree (SA)
1. Teachers have negative attitude towards pupils with disabilities more than those without.

2. Teachers refer children living with autism as special children even in their presence.

3. Children leading normal life prefer to play with children without either physical or intellectual challenges.

4. I have positive attitude towards children living with autism.

5. Female teachers have slightly more positive attitude towards children living with autism than male teachers.

7. Children leading normal life like to help children living with autism in most of school chores e.g. wiping the desk, cleaning the classroom e.t.c.

8. Teachers prefer working with children leading normal life than children living with autism.

| 1. | Does the attitude of teachers towards children living with autism affect their social interaction? | YES (   ) | NO (   ) |
|    | If yes, explain briefly………………………………………………………………………………… |

| 2. | Do you have any advice you can give the children leading normal life on how to treat children living with autism? | YES (   ) | NO (   ) |
|    | If yes, explain briefly……………………………………………………………………………… |

SECTION F: LEARNING OF CHILDREN LIVING WITH AUTISM

Direction: Very Poor (VP), Poor (P), Good (G), Very Good (VG)
How is class participation of children living with autism in a regular class?

How is the general performance of children living with autism?

How do children living with autism perform in mathematics?

How do children living with autism express themselves in class when either answering or asking questions?

How do children living with autism perform in art subjects?

How do children living with autism perform in science subjects?

How do children living with autism perform in languages?

THANK YOU FOR YOUR TIME

Appendix ii: Interview schedule for the headteachers

1. How long have you been in the teaching profession?

2. How old are you and for how long have you been a headteacher?

3. Have you trained in special need education?
4. How many pupils do have in pre-school and how many of them are children living with autism?

5. For how long has your school been practicing inclusive education?

6. Are there changes which have been made, in the environment, classroom setting to ensure effective learning of children living with autism?

7. What is your opinion about children living with autism being placed in regular classes?

8. Do you have feeding program for children living with autism in your school?

9. What are some of the influences of social interaction on learning of children living with autism in your school?

10. How do you overcome the negative influence on learning of children living with autism?

11. What is the way forward for effective learning of children living with autism?

12. How do you compare the performance of children living with autism that of children leading normal life?

13. Who are the personnel in your school who ensure children living with autism improve their learning?

**Appendix iii: Focus group discussion for occupational therapists**

1. What is your role to treatment of children living with autism?

2. What is your age? Kindly indicate your age in the paper provided.

3. Which programs are set to involve children living with autism, children leading normal life, teachers’ assistant and teachers in this school?
4. a) Which services are provided for children living with autism to have positive learning? 
   b) Which of the above services are available in your school? 
   c) How affordable, adequate and accessible are the above services in your school? 
   d) Do the services your offer help in learning of the children living with autism? 

5. Are teachers involved in decision making to improve learning of children living with autism?

6. How are children living with autism treated in this school?

7. How do children leading normal life treat children living with autism?

8. What is the teachers’ perception in inclusion of autism children in regular classes and does this affect the learning of the children living with autism?

9. How is academic learning of children living with autism assessed in your school?

10. How do you compare the performance of children living with autism that children leading normal life?

**Appendix iv: Focus group discussion for the parents**

1. At what age did you discover your child has autism?

2. What is your age? Kindly indicate your age in the paper provided

3. Which characters of your child did you observe that made you suspect that all was not well?

4. Did you take your child for assessment?

5. If you took your child for assessment, which characters of your child made the assessor conclude that indeed your child has autism?
6. Children with autism are affected by foods containing milk, wheat and sweet foods, do you agree with this?

7. How does your child with autism behave when he/she feeds on:
   a) Milk products e.g. yoghurt, cheese etc
   b) Wheat products e.g. weetabix etc
   c) Foods with sugar e.g. juices, cake etc

8. If there change in behavior, after he/she feeds on the foods above, how does it affect their social interaction with other people?

9. Describe any incident where the teacher complained that your child:
   a) Could not settle down in class for learning or disturbed his/her peers?
   b) What type of food he/she had fed on that day?

10. How does diet intervention help your child with autism ability?
   a) To socially interact
   b) To perform well in class

11. Is there change in social interaction of your child with other people after diet intervention?

12. Is any change in academics performance of your child after diet intervention?

13. Generally, how would you comment on the diet of children living with autism and how it influence their learning?

Appendix v: Research permit
Appendix vi: Authorization letter from NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
Nairobi, Kenya

Date:
13th January, 2015

Ref. No.
NACOSTI/P/14/0381/4426

Irene Wanjuki Ngau
Kenyatta University
P.O. Box 43844-00100
Nairobi.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Influence of social interaction on the learning of autistic children in regular preschool in Nairobi County, Kenya,” I am pleased to inform you that you have been authorized to undertake research in Nairobi County for a period ending 31st March, 2015.

You are advised to report the County Commissioner and the County Director of Education, Nairobi County before embarking on the research project.

On completion of the research, you are required to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.

Said Hussein
For: Director-General/CEO

Copy to:
The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.

Appendix vii: Authorization letter from sub-county

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
STATE DEPARTMENT OF EDUCATION

Telegrams: “Schooling” Nairobi
E-mail: kasaranideo@yahoo.com
Fax No: N/A
When replying please quote

SUB-COUNTY EDUCATION OFFICE,
KASARANI SUB COUNTY,
P.O Box 1274-00618,
Ruaraka.