PICTURE EXCHANGE COMMUNICATION SYSTEM APPROACH AND SELF-CONFIDENCE DEVELOPMENT IN CHILDREN WITH AUTISM

Dissertation (thesis) written and presented for partial evaluation with a view to obtaining the Diploma

Master's Degree in Special Education

Option**: Professional Educationalist in Mental Disability**

By

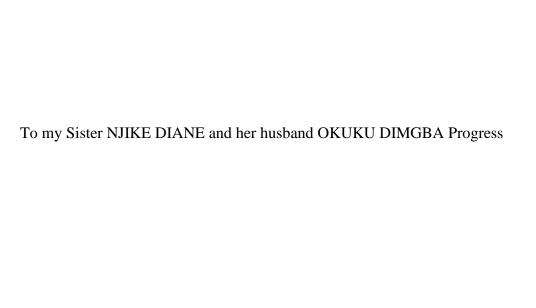**MILLA STANDLEY EKOTA**

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Academic Year 2023-2024

To my Sister NJIKE DIANE and her husband OKUKU DIMGBA Progress

APPRECIATION

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LIST OF ABBREVIATIONS, INITIALS AND ACRONYMS

PECS : Picture Exchange Communication System

ABA : Applied Behaviour Analysis

CRPD: Convention on the Rights of Persons with Disabilities

WHO: World Health Organization

NGO: Non-Governmental Organization

DSM: Diagnostic Statistic Manual

TOM: Theory Of the Mind

ASD: Autism Spectrum Disorder

NDD: Neuro developmental disorder

APA: AMERICAN PSYCHOLOGIST Association

PWD: People With Disabilities

ICIDH: International classification of impairment disability and handicap

ICFD: International Classification of the Function of the Function of Disability

SED: Special Education Needs

UNO: United Nation Organisation

MINESEC: Ministry of Secondary Education

MINAS: Ministry of secondary education

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ABSTRACT

"Picture exchange communication system approach and self-confidence development in children with autism" is in the field of special education and more especially in mental abilities and counselling, and brings out the efficacy of the PECS approach and how it can be used to develop self-confidence in children with autism.

The general objective of our work is to bring out the contribution of the implementation of the Picture Exchange Communication System (PECS) approach and to understand how it develop self-confidence of children with autism. In the theoretical framework we had to show what has been done so far. With these we brought our research question which was to guide our work which took the following format: has the implementation of the Picture Exchange Communication System (PECS) contributed the development self-confidence in children with autism?

This observation took place in Institut Psychopedagogique Einstein. The subjects were put to do an observation in a period of over two months in their inclusive environment which we had to put them in condition and so also the strategies which the teachers used on the kids to boost and build self-confidence in the autistic children. During this research we discovered the self-esteem and confidence of the child changed positively depending on the relation between the autistic child and the educator who has to use the strategies on the autistic children. This is so because these autistic children being different from other children need to be treated as such by the educators.

Key words: Picture exchange communication system approach and self-confidence development in children with autism

RÉSUMÉ

"System de Communication par Echange d'Image et développement de la confiance en soi chez les enfants autistes" s'inscrit dans le domaine de l'éducation spécialisée et plus particulièrement dans celui des capacités mentales et du conseil, et met en évidence l'efficacité de l'approche PECS et la manière dont elle peut être utilisée pour développer la confiance en soi chez les enfants autistes.

L'objectif général de notre travail est de mettre en évidence l'apport de la mise en œuvre de l'approche PECS (Picture Exchange Communication System) et comprandre le développement de la confiance en soi des enfants autistes. Dans le cadre théorique, nous avons dû montrer ce qui a été fait jusqu'à présent. Nous avons ensuite posé notre question de recherche, qui devait guider notre travail, sous la forme suivante : comment la mise en œuvre du Picture Exchange Communication System (PECS) a-t-elle eu un impact sur le développement de la confiance en soi chez les enfants atteints d'autisme ?

Cette observation a eu lieu à l'institut psychopédagogique Einstein, les sujets ont été soumis à une observation sur une période de plus de deux mois dans leur environnement inclusif que nous devions mettre en condition et donc aussi les stratégies que les enseignants utilisaient sur les enfants pour booster et construire la confiance en soi chez les enfants autistes. Au cours de cette recherche, nous avons découvert que l'estime de soi et la confiance de l'enfant changeaient positivement en fonction de la relation entre l'enfant autiste et l'éducateur qui doit utiliser les stratégies sur les enfants autistes. En effet, ces enfants autistes étant différents des autres enfants, ils doivent être traités comme tels par les éducateurs.

Mots clés System par échange d'images et développement de la confiance en soi chez les enfants   autistes.

FIRST PART: CONCEPTUAL AND THEORETICAL FRAMEWORK OF THE STUDY

CHAPTER 1: PROBLEMATIC OF STUDIES

GENERAL INTRODUCTION

Our research was inspired far back in our secondary schools in the South West Region of Cameroon more precisely in our village Bafaka Balue were most children with special needs are often neglected to an extend where education is not even part of their agenda and also from our internships done at the National Rehabilitation Centre For Persons With Disabilities Cardinal Paul Emile LEGER and the Psycho-educative Center which is also as a remediation center. During this period, we observed and discovered that some autistic children despite the used of most communication techniques to develop their personality and self-esteem in order to help adapt with time their studies, there was much lacking to boost their self-confidence, which therefore is the man problem to be solve in this research as we precise with the PECS Approach. Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social and communicative behavior, a restricted range of interest, and excessively repetitive behaviors (American Psychiatric Association [APA], 2013; Faja & Dawson, 2013). The prevalence of the disorder is increasing at an alarming rate in the United States and other countries (Centers for Disease Control and Prevention [CDC], 2016). Research has shown that ASD is associated with genetic and environmental risk factors (APA, 2013; Faja & Dawson, 2013). The impairments of ASD are persistent across multiple settings, and the deficits in communication and interactions result in social impairment and negatively affect the acquisition of speech and language skills. The acquisition of speech and language skills are important in the school setting where the learning process is socially mediated and language based. Early intervention alleviates the impairments of ASD, and federal legislation mandates this intervention to improve the quality of life for individuals with ASD (Heath, Ganz, Parker, Burke, & Ninci, 2015; Love al., 2005). The federal Government has encouraged educators to use evidence-based interventions that have been comprehensively evaluated to positively impact individuals with ASD. The deficits in social communication and social interaction in individuals with ASD are often pervasive and sustained from early childhood through adulthood, limiting and impairing daily functioning and having a negative impact on success and the quality of life

in multiple settings (APA, 2013). Research indicates that early diagnosis and intervention help to alleviate the impairments of ASD and help individuals with ASD to succeed (Heath and al., 2015; Love and 2005). Functional communication training (FCT) is an evidence-based intervention program that has shown effectiveness in increasing appropriate forms of communicative behaviors and decreasing inappropriate forms of communication in individuals with ASD (APA; Franzone, 2009; Lalli, Browder, Mace, & Brown, 1993; Vaughn & Dammann, 2001). This intervention program is a systematic practice that helps individuals with ASD to replace inappropriate behavior or subtle communicative acts with more appropriate and effective communicative behavior or skills (Buckley & Newchok, 2005; Franzone, 2009; Heath et al., 2015). The Picture Exchange Communication System (PECS) is an alternative system of communication used to train individuals with ASD and other social communicative disorders to communicate effectively (Frost & Bondy, 2002). The program is based on the principles of Applied Behavior Analysis (ABA) and teaches strategies, reinforcement strategies, error correction strategies, and generalization strategies to help individuals learn how to communicate effectively (Frost & Bondy, 2002). PECS, which has demonstrated effectiveness, is an FCT plan that actively teaches language skills and builds learning environments that help individuals with ASD develop functional communication skills and eliminate challenging behaviors and inappropriate methods of communication (Frost & Bondy, 2002). The implementation of the PECS program for use with individuals with ASD has been increasing worldwide in schools, community agencies, and the home setting. The use of PECS appears to be associated with improvements in functional communication skills and other positive behavior changes, but more research is necessary to determine the efficacy of this system as the use increases (Pyramid Educational Consultants, 2018). Statement of the Problem Federal laws, such as the Individuals with Disabilities Education Act (IDEA) and the Every Student Succeeds Act (ESSA), establish rights for individuals with disorders, and the IDEA guarantees that every individual, including those with disabilities, the right to a free and appropriate public education tailored to individual needs and delivered in the least restrictive environment (Semrud-Clikeman & Ellison, 2009; United States Department of Education, 2018). These laws stress the need for all schools in the United States to guarantee that efforts are made to ensure that students with disabilities are able to communicate in order to help them achieve academic success (Andzik, Cannella Malone, & Sigafoos, 2016). ASD is a disability characterized by significant deficits in communication and

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in multiple settings (APA, 2013). Research indicates that early diagnosis and intervention help to alleviate the impairments of ASD and help individuals with ASD to succeed (Heath and al., 2015; Love and 2005). Functional communication training (FCT) is an evidence-based intervention program that has shown effectiveness in increasing appropriate forms of communicative behaviors and decreasing inappropriate forms of communication in individuals with ASD (APA; Franzone, 2009; Lalli, Browder, Mace, & Brown, 1993; Vaughn & Dammann, 2001). This intervention program is a systematic practice that helps individuals with ASD to replace inappropriate behavior or subtle communicative acts with more appropriate and effective communicative behavior or skills (Buckley & Newchok, 2005; Franzone, 2009; Heath et al., 2015). The Picture Exchange Communication System (PECS) is an alternative system of communication used to train individuals with ASD and other social communicative disorders to communicate effectively (Frost & Bondy, 2002). The program is based on the principles of Applied Behavior Analysis (ABA) and teaches strategies, reinforcement strategies, error correction strategies, and generalization strategies to help individuals learn how to communicate effectively (Frost & Bondy, 2002). PECS, which has demonstrated effectiveness, is an FCT plan that actively teaches language skills and builds learning environments that help individuals with ASD develop functional communication skills and eliminate challenging behaviors and inappropriate methods of communication (Frost & Bondy, 2002). The implementation of the PECS program for use with individuals with ASD has been increasing worldwide in schools, community agencies, and the home setting. The use of PECS appears to be associated with improvements in functional communication skills and other positive behavior changes, but more research is necessary to determine the efficacy of this system as the use increases (Pyramid Educational Consultants, 2018). Statement of the Problem Federal laws, such as the Individuals with Disabilities Education Act (IDEA) and the Every Student Succeeds Act (ESSA), establish rights for individuals with disorders, and the IDEA guarantees that every individual, including those with disabilities, the right to a free and appropriate public education tailored to individual needs and delivered in the least restrictive environment (Semrud-Clikeman & Ellison, 2009; United States Department of Education, 2018). These laws stress the need for all schools in the United States to guarantee that efforts are made to ensure that students with disabilities are able to communicate in order to help them achieve academic success (Andzik, Cannella Malone, & Sigafoos, 2016). ASD is a disability characterized by significant deficits in communication and

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interactions with restricted, repetitive patterns of behavior, interests, and activities that result in social impairment and create obstacles to learning and academic success (Hallahan and al., 2012). Individuals with ASD lack a functional system of communication and often engage in challenging behaviors and inappropriate modes of communication in order to obtain attention and communicate their desires. FCT has shown to be an evidence-based effective intervention that increases appropriate communicative behavior and decreases challenging behavior and inappropriate forms of communication in individuals with ASD (Lalli 1993). PECS is an alternative or augmentative system of communication and an FCT plan that improves communication skills in individuals with ASD (Frost & Bondy, 2002). The training manual for PECS has been updated and translated into 15 languages worldwide, and the program continues to be implemented successfully in educational and home settings with positive results throughout the world (Pyramid Educational Consultants, 2018). In response to federal legislation mandating the ability to communicate in order to succeed and experience a better quality of life and the increased use of PECS, more research concerning the efficacy of FCT programs such as PECS implemented in community mental health settings is necessary. This research is to examine the effectiveness of the PECS approach by analyzing the self-confidence development in children living with ASD.

1.1 Context and justification of research

The context of research in Cameroon and most especially in Yaounde where our work was carried out focused on exploring the experiences of parents, caregivers, and educators who have implemented PECS in children with autism in Cameroon. The research examined the impact of this approach on the children's communication skills and self-confidence in the specific cultural, social context of Cameroon. In line with some authors such as Tony Charman (2002): "Is There a Social Skills Deficit in Autism?" This article informs the cultural context of autism in Cameroon and the social skills deficits that children with autism may face. Dora Mbuwayesango (2013): "Disability and Social Change in Cameroon: A Case Study of Families in Children with Disabilities." This article can provide insights into the social context of autism in Cameroon and the challenges faced by families of children with disabilities. Jean-Bernard Kouassi (2016): "Parental Experiences of Raising Children with Autism in Cameroon." This article provides valuable insights into the challenges faced by families who are implementing PECS as a communication tool. By conducting interviews or surveys with parents, caregivers, and educators in Cameroon and consulting the work of these authors, we gained a better understanding of the effectiveness of PECS as a communication tool and self-confidence development approach for children with autism in Cameroon.

As an objective of bringing our humble contribution on the follow up of vulnerable children. We are going base ourselves on children having mental disability in particular children with autism spectrum disorder (ASD). So, it will consist of measuring the level of their vulnerability which will. This will help in determining their needs given their level of their disability. All this refer the factors that determine their vulnerability.

Autism spectrum disorder being part of mental disorder which is as old as history, still exist in our human communities. Children with this disability which can be congenital, neurodevelopmental in consequence puts them in a vulnerable situation. Autism spectrum disorder has its roots from the XXth century. This autism spectrum disorder or autism was considered as infant schizophrenia, it is only in the 1940s that Leo Kanner and Hans Asperger changed the way these children were seen and found reasons in removing the view people had of them as infant schizophrenic children. Leo Kanner American psychiatrist with German origin affirmed that some of the children were not like others but had another disorder. At this point Kanner described these children were suffering from autism characterized by repetitive action,

stereotyped behaviors, don't talk, and do not communicate. Hans Asperger, for him, uses the same term; he says they have an intellectual superiority compared to infant autism. Autistic children don't need medicine for growth but instead they need education which will help in their development and help to solve their disability. According to some research carried out by vox Africa (2022) autist children in Cameroon are considered, as not always considered to be children like others but their deference is taken for witchcraft in Cameroon so, a campaign in (January 2021) was organized in which a door-to-door campaign to create awareness for parents to educate or rather send their children to school was organized. These efforts being done by the Cameroonian government cannot be underestimated but there is still much to be done on the quality of life of these autistic children.

In order to create awareness of this worry of mentally disabled children and children in particular so, after the first world war we had the creation of the UNO which under it was created an organ called the UNICEF (1946) and others this organ was concerned with the education of children. These organs were created so as to promote the wellbeing of children presenting all forms of disability in particular mental disabled children. All these will be centered more on the educative domain. These organs were created not only for the promotion but to urge each society on how handle situation concerning the taking care of children. This is so to permit the respect of their right so as to give more benefits to these children who represent the future.

Given autistic children presenting issues of vulnerability which is due to the change and evolution of the society we leave in. So, this doesn't permit us to neglect them but act as their guide through this changing environment so, accompanying them through their own process of change which make their leaving in the society more comfortable. So, when in a family or a community a child of this nature (autistic child) is born some dispositions has to be taken into consideration before the child is presented to the world. This is so to help them fight these vulnerable factors which may act against them.

  In continuation this initiative here is to solve the issue of the exclusion and stigmatization of autistic children in Cameroon. Making as objective the full integration of children leaving with this disability. Autism spectrum disorder being a major societal ill has been studies to know it frequency in the world. So, according to the WHO 1/100 children are born with autism spectrum disorder. These statistics vary geographically because, it will depend on the availability of early

diagnosis which is important cause with this, and the number of autistic children will reduce due to early diagnoses. We mentioned that the frequency of children born with autism spectrum disorder depend on the state of the geographical location. Because we have realized that the frequency is higher in under developed and in developing countries. This is so because in African countries there is lack of a good early diagnose which will high up the number of autistic children found in the continent. This may be caused by technological advancement which makes families not to be aware of the disorder and seek or be referred to an appropriate, better and adequate knowledge in the education sector which will help solve this problem. Such weak knowledge makes the awareness and also pause similar challenges. So, given that Cameroon being a country in Africa has the same problem. Cameroon having a frequency of autism stated according to the world health organization as out of every 10,000 children at least 6 are autistic and so makes it convertible to give an estimate of 600,000 per 10 million people so, after all these we can see how high the level of children with ASD has increased in the cause of time given that till date the early diagnosis and educational intervention is still very poor.

Given all these facts, if we talk about the quality of life of autistic children, we must know it will get it origin from the vulnerability of the autistic child now given the changes which are occurring in this our developing world there is a great reason for specialize educators to know how to tackle this matter which make autistic children vulnerable in the society today. With all this educational implication not only school but the society at large must participate in the elimination of this bad consequence of the disorder. To this, the follow up being an important aspect in the life an autistic person so, the follow up here will be on the educational a familiar domain.

- The society: this is because in this the process of follow there is the society which make part of the life of the ADS child and so should be the first to take part in the follow up of the child. This is so because when a child is diagnosed with ASD it is the society which must welcome him a look for ways in which he will adapt given his situation.

- The family: The owner of the child is obligated to understand the child's situation and even give him a home to leave in and consequently they are first in the education of the child, which in consequent will guarantee his wellbeing and the quality of his adaptation to the society he leaves in.

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In the care and support of people with PDD, more particularly autistic children, in Cameroon, three components can be observed which act simultaneously in complementarity: the medical and health component, the social component, and the school component. The first represents hospital and health services in general and mainly psychiatry, neuropsychiatry, speech therapy and psycho-motricity services. These services are responsible for screening, aspects of comorbidities resulting from the disease and, to a certain extent, rehabilitation. The second component represents the social component and is intended to be the mediator between the family in difficulty and the interveners. Represented by the Ministry of Social Affairs, it directs, manages, clarifies, coordinates activities around the care of children suffering from autism, which is understood here as a child suffering from a severe handicap. He welcomes the parent or any other applicant, directs him to the appropriate services, he regulates the activity of the school and medical-sanitary component through laws, charters, training sessions and awareness days on the disturbance as well as any other actions it undertakes. It works in partnership with the Ministries in charge of National Education, whose actions and companies it coordinates. The third component which is not the least is the school component. In Cameroon, the integration of children with special educational needs is not a matter of charity but a constitutional right of all children and a duty of the Cameroonian State, which thus aligns itself with international requirements in terms of human rights. Disabled, including the right to education (UN CRPD, Article 24). Decree No. 90/1516 of November 26, 1990 setting the terms of application of Law No. 83/013 of July 21, 1983 relating to the protection of disabled persons, which includes provisions on assistance with education of this target, not including age exemption, resumption of class and financial support. It is in this order that the signing of two (02) joint circular letters by the Ministry of Social Affairs (MINAS.) and the Ministry of Secondary Education (MINESEC) respectively on August 2, 2005 and August 14, 2007, aiming to facilitate the admission of disabled pupils and pupils born of disabled parents to public secondary schools and their participation in official examinations. This law also stipulates a promotion of school integration as well as equality of all children in access to education, without taking into account their mental, physical or even intellectual capacities. Such an initiative is also provided for in an article of the law of 13 April 2010 relating to the protection and promotion of disabled people, which defines special education as that which "consists of initiating the physically, sensory, mentally and with multiple disabilities to appropriate methods of communication in order to

allow them access to normal schooling, and later, to vocational training". It is this legal and also legitimate basis that governs and frames the operation of the third components.

1.2. Problem statement

1.2.1. The theoretical findings

The strategy of acting for PECS is based on the principles of ABA (Applied Behaviour Analysis), the verbal behaviour approach and the assumptions of the Pyramid Approach to Education. Theoretical consolidation of PECS is supported by the results of scientific research conducted in the field of applied behaviour analysis. The Picture Exchange Communication System is an alternative communication system developed in 1985 by Andy Bondy and Lori Frost. It is a visual system which is based on exchanging pictures. In the light of the failure of the traditional approach to improve speech and communication in people with autism spectrum disorders (ASD), the system creators were looking for a way that would allow those people to communicate (Kaczmarek, 2014). The authors' task was to develop a method that: enables effective development of learning how to communicate with children who have no way to communicate their intentions through speech, gesture or facial expressions, enables to discontinue verbal prompt, allows the child to understand the rules regarding communication, will be easy to use in everyday life (Kawa, 2015).

The theoretical findings of our research and in regards to certain authors, children with ASD often struggle with social communication and may have difficulty expressing their needs and wants. The PECS approach involves using pictures to help children communicate, allowing them to exchange pictures for items or activities they desire. The study found that after implementing the PECS approach, children with ASD showed significant improvements in their communication skills, including increased use of language and more complex sentence structure. Additionally, the children demonstrated increased self-confidence and independence, as they were better able to communicate their needs and desires. Others suggest that the PECS approach can be a valuable tool for parents and educators working with children with ASD, as it provides a structured and systematic way to improve communication skills and promote self-confidence. And also emphasize the importance of ongoing support and training for parents and educators to ensure successful implementation of the approach. Some of our findings are based on the following aims. Artistic skills, reinforcement, and social interaction can indeed play a significant

role in developing self-confidence in children with autism. Here's how each of these factors can contribute to their growth:

Artistic Skills: Engaging in artistic activities such as drawing, painting, music, or dance can have numerous benefits for children with autism, including the development of self-confidence. Here's how artistic skills can help:

- Non-Verbal Expression: Art provides a non-verbal outlet for self-expression, allowing children with autism to communicate and express themselves creatively, even if they struggle with verbal communication. This can boost their confidence as they learn to effectively convey their thoughts and emotions.

- Sensory Engagement: Artistic activities often involve sensory experiences, such as the feel of different textures, the sound of music, or the visual appeal of colors. These sensory engagements can provide a therapeutic and enjoyable experience, promoting self-confidence and positive self-esteem.

- Mastery and Achievement: As children with autism develop artistic skills, they experience a sense of achievement and mastery over their abilities. This sense of accomplishment can boost their self-confidence and motivate them to continue exploring and developing their artistic talents.

 Reinforcement: Plays a crucial role in shaping behaviors and building self-confidence. Positive reinforcement involves providing praise, rewards, or recognition for desired behaviors or achievements. Here's how reinforcement can help:

- Encouragement and Recognition: By offering specific and genuine praise for their artistic efforts, children with autism receive validation and acknowledgment. This positive feedback reinforces their sense of accomplishment and boosts their self-confidence.

- Breaking Tasks into Achievable Steps: Artistic activities can be broken down into smaller, achievable tasks. As children successfully complete each step, they receive reinforcement, which helps them build confidence in their abilities. Gradually increasing the complexity of tasks can further bolster their self-assurance.

Social Interaction: Social interaction is vital for children with autism as it helps them develop social skills, build relationships, and enhance their self-confidence. Artistic activities can facilitate social interaction in the following ways:

- Collaborative Art Projects: Encouraging children with autism to participate in collaborative art projects promotes teamwork and cooperation. Working alongside peers or family members not only helps develop social skills but also fosters a sense of belonging and self-worth.

- Art-Based Group Activities: Group activities such as art classes or workshops provide opportunities for children with autism to interact with their peers who share similar interests. Engaging in shared creative experiences can help them develop social connections, improve communication skills, and boost self-confidence.

- Exhibition and Sharing: Arranging exhibitions or showcase where children can display their artwork to others promotes social interaction and provides a platform for self-expression. Positive feedback from others can enhance their self-confidence and encourage further artistic exploration.

It's important to note that individual preferences and needs may vary among children with autism. Therefore, it's crucial to consider their unique strengths, interests, and sensitivities when incorporating artistic skills, reinforcement, and social interaction into their development plans.

These theoretical considerations are general and not specific to the Cameroon context. The actual theoretical findings and conclusions would depend on the specific study, its methodology, participant characteristics, and the context in which the research is conducted.

The autistic child who was first of all known as a child suffering from child psyzophrenia here makes it a difficulty to situate them in a social society and determine for them a better experience in the society this is so because the child being in a state of disability here is subjected to some limitations which can be familiar, in school and in different social gatherings. So, in consequent gives the child a lot of difficulties and complication in the day today leaving of the society.

The complication we are talking about here is the one which is manifested by the environment in which the autistic child leaves. So, this shown through beliefs, judgment and sometimes a wayward negative look etc.

The Picture Exchange Communication System uses simple pictures to get through the visual channel to explain to people with ASD what social communication is. Along with the development and improvement of PECS methods, it was recognized that it can be successfully used to build communication also in people with speech disabilities other than ASD. Currently, PECS is being introduced into therapy for children and adults who experience various disorders and deficits in speech, language, communication (Kaczmarek, 2014). When introducing the PECS therapy, a person learns to express his needs using a symbol (image) that represents a particular thing, activity, feature, etc. The start of the PECS program does not assume the patient's pre-existing skills, such as: making eye contact to respond to commands or imitation. The authors of the system are expecting that the person who masters the next phase of PECS should express their needs, comment on events, answer questions and make a dialogue using complex phrases (Kawa, 2015).

The society being at the source of the way children with autism are being perceived because they are there is not an autistic child but there is a spectrum which will vary in term of symptoms, skills and the level of impairment which will make the individual will ASD when diagnose will experience (DSM-5, APA, 2013) So this in turn makes the society as modified as it is today the child with ASD. The evolution of the environment or even the society for a proper life style of the a ASD child the principle of restructuring education will be implemented and it will be done under three ways which are; making an activity attractive, structuring the space, time and activities. With all these it is important for child with disability to ensure that they are valued and their dignity and rights are being respected and that they find an environment which is welcoming and to them(UN disability strategy, 2022) still in the continuation given that there is a principle of social reciprocity and the autistic child In order to adapt his behavior to that of the environment he has to mold his behavior in such a way that when met with contextual problem of this our present society the child is to adapt

1.2.2. The empirical finding

Our research is born or was inspired from internship done at the psycho-educative center which is also as a remediation center. During this time, we spent there, we discovered these children who hard a perturbation in three domains which where abnormalities in their social interaction

(reciprocate in socialization), abnormalities in communication (verbal and non-verbal), restraint interest and adaptation precisely on their educational perspective. Since our studies will be carried out on child autism in the domain of disability, we have a family of intellectually or rather mentally disabled children. Major concern here is autism spectrum disorder. Autism spectrum disorder is defined as a neurodevelopmental disorder characterized by altered verbal and non-verbal language development, social Impairment and repetitive behavior DSM-5 (2013). To evaluate in the domain of disability inclusion has been and will always be one of the major preoccupations of special educators. The term here could be understood here as bringing a sense of belonging of individuals irrespective of their race, health, cultural background and disabilities. Given that Africa and Cameroon in particular being stormed by so many characteristics of developing countries, statistics of the UN that over 700000 people leave with autism in Cameroon VoxAfrica (2021). The adaptation of this children here in our work will touch the societal evolution on the education sector. Given that these children suffering from autism spectrum disorder are not to be left out, we are force to talk on how these children will adapt to the fast-changing society. The here is not the one of looking for solutions elsewhere but given that the inclusion strategies are already there our take now is to analyses the adaptation of the autistic child in the society. Given that educationist do not spontaneously adhere to inclusive education reforms; they often suspicious of attempt of change (Tardif and lessard 2002). To continue it is also important to see how other people manage the problem of the adaptation of mentally disabled persons and autistic in particular through inclusive strategies. Since the first identified by Kanner in 1943, the knowledge and understanding of autism has grown and it is now recognized as a neurodevelopmental disorder that Impair the child's ability to communicate, interact or relate to other people and the world around them (Batten,2005; Willis 2006) .

According to the DSM IV it is seen that there has been an evolution on the concept of autism with the DSM IV we see that it is a spectrum which means, that the children are differencing in the manifestation of their symptoms. Adaptability here is the inability to meet developmental and socio-cultural standards for personal independent and social responsibility through educative follow up.

In education all children have the right to education and to a good social and are suppose meet an environment which sorts them. In every educational milieu there is a pedagogic way of teaching

so as involving the said normal children and children with disability so given our interest is much more on mental disabled persons in particular autistic children. Autistic children in their way of perceiving the world is much more deferent to the one of neurotypical child that is, the world to an autistic person is more of detail that global.

Traditionally autism is seen a psychiatric disorder but as a consequence of the development of the term witchcraft, many children in our African and Cameroonian settings are mostly taken for children who have which and some even go as far as saying a curse was place on these children. Many children with autism are kept behind doors and chained for life. So, others are brought up in isolation, mental hospitals and other in some custodial institution. This is so given some measures are not taken to make these children participate in active life given their different perception of the world of the world is not mostly considered in mainstream schools. Given that these children manifest characteristic of communication, social, cognitive and sensory impairment their welfare in mainstream schools are not usually considered. What is seen is first of all the learning which lacks a type of collaboration which at the end make the learning a segregated learning. This is so because CWA segregated and so given that those teachers see all disabilities and most look for a way to include everyone in the education process without removing exclusion. The educative system and the way the children and the inclusive learning is not adjusted depending on the environment which is changing. The curriculum should be made in such a way which promotes an education and a society which is modified for all.

More so, autistic children seem to view more detailed what is global they turn to see the detail part of it what is represented so as a result the society which does not understand this their perception of things is sometimes not able to be modified in other for the child to adapt. So, in children with ASD atypical sensory development proceeded social communicative symptoms, sensory hypo-responsiveness predicted subsequent lower level of joint attention and language development

To some teacher it is difficult for them to teach student with disability and control their behavior at the same time and so general teachers do not see this inclusive approach as a good one because they think it will be a good thing they are provided with resources and personnel and so given the expensive side of mainstream schools in Africa they cannot keep with standard way of an inclusive class. Given that in each class an inclusive school it is supposed to be made up of three

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main personnel's which is made up of the normal teacher, the special educationist and a psychologist specialized in the disability which is faced by the child. This is so because the capacities of these teachers in inclusive settings are sometimes very low and so they see they are not able to organize the educational background to suit the one the children so. So, they have les strategies which will help them to organize these children feel belonging in the educational sector.

The theoretical findings have some loop holes we had to do a field work which we discovered that a number of children ASD in this center have issues of with knowing their self as in esteem so boosting their self-confidence was one of the best techniques even though it was not a one hundred percent and so they are being subjected to the way of learning which does not hold to their various state of disability. And so, from the theoretical and empirical findings we bring the scientific problem which is, the effectiveness of the PECS approach and its contribution to self-confidence development in children living with ASD with autism.

1.3.1. Research question
Does the implementation of the Picture Exchange Communication System (PECS) contribute the development self-confidence in children with autism?

1.3.2. Specific research question
SRQ1: Does the use artistic skills contribute the development of self-confidence in children with autism?

SRQ2: Does the use of reinforcement contribute to the development of self-confidence in children with autism?

SRQ3: Does the use of social interaction contribute to the self-confidence development in children with autism?

1.5.1. Research objective
To understand the implementation of the Picture Exchange Communication System (PECS) and how it contributes to the development self-confidence of children with autism

1.5.2. Specific objectives

SO1: To understand the use artistic skills on the development of self-confidence in children with autism.

SO2: To understand the use of reinforcement on the development of self-confidence in children with autism.

SO3: To understand the use social interaction on the self-confidence development in children with autism.

1.6.1. The Interest and pertinence of the research

Our general interest is the potential for the PECS approach to improve the quality of life for children with autism by enhancing self-confidence.

The scientific interest «lies in exploring the effectiveness of the Picture Exchange Communication System (PECS) in promoting self-confidence among children with autism. This topic combines two important areas of research: communication interventions for children with autism and the impact of these interventions on their self-confidence. PECS is a widely used communication intervention for individuals with autism spectrum disorder (ASD) who have limited or no functional speech. It involves using a system of pictures or visual symbols to facilitate communication and language development. The PECS approach aims to teach children with autism a functional means of communication, enabling them to express their needs, desires, and thoughts effectively.

Self-confidence is a crucial aspect of overall well-being and development in children, including those with autism. However, children with autism often face challenges related to social interactions, communication difficulties, and limited verbal skills, which can impact their self-confidence. Therefore, understanding how communication interventions like PECS can influence self-confidence in this population is of significant scientific interest. Studies examining the relationship between the PECS approach and self-confidence development in children with autism can shed light on several important aspects. These include:

Efficacy of PECS: Research can investigate whether the implementation of the PECS approach leads to improved communication skills and language development, which in turn may contribute to increased self-confidence in children with autism.

Social Engagement: The use of PECS may enhance social interactions and participation in various settings, such as home, school, and community. By exploring the impact of PECS on social engagement, researchers can determine whether increased social interactions positively influence self-confidence in children with autism.

Empowerment and Independence: PECS empowers children with autism to actively communicate their needs and make choices independently. Investigating how this increased autonomy impacts their self-confidence can provide valuable insights into the psychological well-being of these children.

 Generalization of Skills: Research can examine whether the skills learned through the PECS approach generalize beyond the training setting. For example, do children with autism exhibit improved self-confidence not only during PECS-specific activities but also in other communication contexts? Authors who have contributed to the scientific literature on this topic include: Lori Frost and Andy Bondy: The creators of the PECS approach, Frost, and Bondy have conducted research and published extensively on the topic. Their work focuses on the practical implementation of PECS and its impact on communication, social skills, and independence in individuals with autism. Kathleen Quill: Quill is a renowned autism expert who has written about various aspects of autism intervention, including the use of PECS. Her research explores the effects of PECS on communication development and its relationship with social-emotional outcomes, including self-confidence.

Patrick McGreevy: McGreevy has conducted research on the effectiveness of PECS and its impact on language development, social skills, and self-confidence in children with autism. His work emphasizes the importance of individualized approaches and the role of PECS in empowering children with autism. These authors, among others, have made significant contributions to the scientific understanding of the PECS approach and its relationship with self-confidence development in children with autism. Their research helps inform interventions and support strategies for individuals with autism, promoting their overall well-being and quality of life.

The topic of "PECS Approach and Self-Confidence Development in Children with Autism" is of significant social interest due to its relevance to the well-being and development of children with

autism. The Picture Exchange Communication System (PECS) is a widely recognized and evidence-based approach used to improve communication skills in individuals with autism spectrum disorder (ASD), particularly those who have limited or no speech.

1.6.2. The social interest

The fact that communication difficulties are a core characteristic of autism, and they can significantly impact an individual's social interactions, academic performance, and overall quality of life. By focusing on the PECS approach, which utilizes visual supports to facilitate communication, researchers and practitioners aim to enhance communication and language skills in children with autism. Self-confidence development is another crucial aspect addressed in this topic. Children with autism often experience challenges in social interactions, which can lead to feelings of frustration, anxiety, and low self-esteem. By empowering children with effective communication tools, such as the PECS approach, it is believed that their self-confidence can be boosted. Improved communication skills can enhance their ability to express needs, wants, and feelings, leading to increased social participation and a sense of self-efficacy.

Catherine Lord, PhD: A leading researcher in the field of autism, Dr. Lord has contributed to the understanding of autism spectrum disorder, its diagnosis, and interventions. Her work encompasses various aspects of autism, including communication and social development. Tony Charman, PhD: Dr. Charman's research focuses on early identification and intervention for children with autism. He has conducted studies examining the impact of interventions, including the PECS approach, on communication and social outcomes in children with ASD. Patricia Howlin, PhD: Dr. Howlin is a renowned researcher in the field of autism, with a particular emphasis on interventions and outcomes for individuals with ASD. Her work encompasses various aspects of autism, including communication interventions and social functioning. These authors, among others, have contributed significantly to the understanding and application of the PECS approach and its impact on self-confidence development in children with autism. Their research has informed professionals, educators, and parents about effective strategies for supporting individuals with autism in their communication and social-emotional development.

The psychological interest due to its implications for understanding and addressing the psychological well-being of children with autism. Several psychological aspects are relevant to this topic, including social cognition, self-esteem, and emotional well-being. Researchers and

authors focusing on this topic have explored these areas and their relationship to the PECS approach. Here are some psychological interests associated with the topic, along with relevant authors:

Social Cognition: Social cognition refers to the mental processes involved in understanding and interpreting social information, such as emotions, intentions, and social cues. Children with autism often experience difficulties in social cognition, which can affect their ability to engage in meaningful social interactions. Authors such as Simon Baron-Cohen, PhD, have conducted research on the social cognitive profiles of individuals with autism and the impact of interventions, including communication approaches like PECS, on social cognition development.

Self-Esteem and Self-Perception: Self-esteem plays a crucial role in psychological well-being and is influenced by various factors, including social interactions and communication abilities. Children with autism may face challenges in these areas, which can impact their self-perception and self-confidence. Authors such as Peter Vermeulen, PhD, have explored self-esteem and self-perception in individuals with autism and how interventions, including communication strategies like PECS, can positively influence these aspects.

Emotional Well-being: Emotional well-being encompasses the ability to recognize, understand, and regulate emotions effectively. Children with autism often experience difficulties in emotion recognition and regulation, which can affect their overall psychological well-being. Authors like Tony Attwood, PhD, have studied emotional well-being in individuals with autism and how interventions, including communication approaches like PECS, can contribute to emotional understanding and regulation.

Parent and Family Perspectives: The psychological well-being of children with autism is closely tied to the experiences and perspectives of their families, particularly parents. Authors such as Bryna Siegel, PhD, have explored the psychological impact on parents of children with autism and the role of interventions, such as the PECS approach, in supporting both the child and the family's psychological well-being.

By examining these psychological interests, researchers and authors contribute to a deeper understanding of how the PECS approach can influence social cognition, self-esteem, emotional well-being, and family dynamics in children with autism. Their work informs professionals,

educators, and families in implementing effective interventions to support the psychological development and well-being of children with autism.

1.6.3. To the mental health specialists:

One interest to mental health specialists on this topic is the potential for the PECS approach to reduce anxiety and frustration in children with autism who struggle with communication. By providing them with a means to express themselves effectively, children with autism may experience less stress and feel more in control of their environment, which can have a positive impact on their mental health and well-being. Additionally, the development of self-confidence through successful communication can improve their overall resilience and ability to cope with challenges.

1.6.4. To science and the world of research

There are several benefits of using PECS as a communication technique, including increased self-confidence and improved social interaction. A study by Flippin, Reszka, and Watson (2010) found that the use of PECS resulted in increased self-esteem and self-efficacy for children with ASD. The children were able to communicate their needs and wants more effectively, which led to increased independence and a greater sense of control over their environment. In addition to improving communication and self-confidence, the use of PECS has also been shown to improve behavior in children with ASD. A study by Charlop-Christy, Carpenter, LeBlanc, and Kellet (2002) found that the use of PECS resulted in significant reductions in problem behaviors such as aggression, tantrums, and noncompliance. The use of PECS as a communication technique has been shown to have numerous benefits for children with ASD, including increased self-confidence, improved social interaction, and reduced problem behaviors. These benefits can have a significant impact on the overall quality of life for children with ASD and their families.

1.7.1. Delimitation of the study

It is important to note that the use of PECS as a communication technique and its impact on self-confidence development in children with ASD may vary in different contexts. Therefore, this topic will be delimited to the country of Cameroon, focusing on the spatio-temporal factors that may influence the implementation and effectiveness of PECS in improving communication skills and self-confidence in children with ASD. This will include factors such as cultural beliefs and practices, availability of resources, and access to specialized services for children with ASD. The

temporal aspect will focus on the current state of implementation of PECS in Cameroon and any changes or improvements that have occurred over time.

This is to describe the geographical framework of our study. We would have liked to extend our research to all the reception centers for children with disabilities in the central region to make our results more reliable. But given the various financial and time obstacles we will limit ourselves to institute psychopedagogique Einstein. This study spanned the academic year 2022-2023 It began with a pre-survey and documentary research. As part of this study, we are interested in the effectiveness of the PECS approach in children living with ASD. In short, this chapter has allowed us to formulate our research problem, specify our research hypotheses, and define the objectives and interest of the study.

CHAPTER 2:   LITTERATURE REVIEW

2.1. Notional approach of PECS

In Africa, there is limited research on the use of PECS, and most studies have been conducted in South Africa. However, there is a growing interest in the use of PECS in other African countries, including Cameroon. In Cameroon, there is no national approach to the implementation of PECS. The use of PECS is mainly based on the availability of resources and the expertise of professionals working with children with ASD. According to a study by Nkeh (2019), the use of PECS in Cameroon is limited due to the lack of awareness and training among professionals, as well as the limited availability of resources such as picture cards and communication boards. However, there have been some efforts to improve the implementation of PECS in Cameroon. For example, the Autism Association of Cameroon (AAC) has organized training sessions for parents and professionals on the use of PECS and other communication techniques. Additionally, some schools and centers for children with ASD have started implementing PECS as part of their intervention programs.

Globally, the use of PECS has been recognized as an evidence-based practice for individuals with ASD. According to a systematic review by Reichow (2012), PECS has been found to be effective in improving communication skills and reducing problem behavior in individuals with ASD. However, the effectiveness of PECS may vary depending on factors such as the individual's age, cognitive ability, and level of impairment. While there is no national approach to the implementation of PECS in Cameroon, there have been some efforts to improve its use. Further research is needed to understand the effectiveness of PECS in the Cameroonian context and to identify any cultural or contextual factors that may impact its implementation and effectiveness.

2.1.2 The history of PECS

Bondy and Frost (1994) developed PECS for the Delaware Autistic Program to teach 85 two-year-old children with Autism and other social communicative disorders to make requests to ultimately acquire the skills to communicate independently in social contexts. Initially, these children either did not speak, had echoic speech, only spoke when prompted, or only produced speech in socially unacceptable ways including self- stimulatory behavior through scripting.

Following the children over 5 years, 76% of children placed on PECS either produced speech or developed speech augmented by the picture system (Bondy & Frost, 1994). The key component and prerequisite to beginning PECS is the motivation of the user. The motto of PECS is to "teach to the reach". This implies that the user indicates what is reinforcing to them by pointing to, moving towards, or reaching for a specific object, item or person (Frost & Bondy, 2002).

Unlike the aforementioned communicative modalities, Frost and Bondy (2002) describe PECS as adaptable and explain that the user does not require prerequisite skills to communicate. Children do not need requisite fine motor skills and PECS techniques can be adapted to compensate for weak grip by using cardboard or glue on the PEC. There is no requisite developmental age and children do not need to understand the meaning of pictures before implementation. Children do not need to have mastered eye-to-eye contact, attentive sitting, and response to questions or object matching. The system does not require the communicative partner to be familiar with an additional language. PECS is low cost, portable and is suitable for many settings. Most importantly, the user does not have to be nonverbal to benefit from PECS (Frost & Bondy, 2002). PECS incorporates functional communicative responses that promote meaningful interactions between the environment and the child (Bondy and Frost, 1994). PECS involves six phases that progressively teach functional communication and improve the user's vocabulary.

Phase 1: Teaches users how to communicate by reaching for a single picture and exchanging it with a communicative partner for a functional reward. A back-prompter is a second individual positioned behind the user who ensures the user exchanges the PEC correctly to their partner.

Phase 2: Enforces persistence and distance by using a backward chaining format to fade out the back-prompter and communication partner. Backward chaining involves breaking a complex sequence into small steps and teaching in a step-wise manner with the last step first. This phase generalizes skills learned in phase one by increasing the distance between book and communication partners and also by introduction of new communicative partners.

Phase 3: Involves picture discrimination between preferred and non-preferred pictures. It involves conducting correspondence checks to ensure the user is requesting what they really want.

The goal of Phase 4: Is to build simple sentences using "I want" PEC and placing it on the sentence strip.

Phase 5 and 6: Expand attributes and language vocabulary by adding adjectives, verbs and nouns. Phase 5 teaches users to answer questions while phase 6 teaches users to comment. These 6 phases embrace specific principles of ABA such as reinforcement, and adapting training techniques based on collected data to emphasize the development of functional communication skills (Frost & Bondy, 2002). PECS relies on principles of ABA including distinct prompting, shaping, positive reinforcement, broadening stimulus control and setting events, errorless teaching, and error correction. These principles are intimately incorporated throughout all 6 training phases. Additionally, PECS incorporates B.F. Skinner's verbal operants, which are central to ABA. There are 4 main verbal operants defined by antecedent and consequential factors that are all central to PECS usage. A mand is a verbal operant "in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions of deprivation or aversive stimulation" (Skinner, 1957, p. 35-36). A tact "evoked by a particular object or event or property of an object or event (Skinner, 1957, p. 82). Tacts occur due to the environmental objects or events. An example of manding and tacting occurs in PECS phase 1 where the communicative partner labels the item (tacting) and then immediately provides the functional reward requested (manding and positive reinforcement). Furthermore, phase 4 involves autoclitic operants which are under the control of the speakers own verbal behavior (Skinner, 1957). For instance, the use of the "I want" PEC develops an autoclitic frame. Phase 5 and 6 include the use of intraverbal operants that are verbal behavior under the stimulus control of other verbal behavior (Skinner, 1957). For example, in phase 5 when asked "what do you want?" the response of the user is partially under the control of the communicative partner's question. All 6 phases of PECS deeply rely on the principles of ABA in order to successfully develop functional communication

(Frost & Bondy, 2002). Picture Exchange Communication System (PECS) emphasizes teaching a child to initiate requesting for seen and unseen items, to respond to questions, and to make social comments and labels. The literature suggests that PECS are effective in improving speech impairments. Charlop-Christy (2002) conducted a study to empirically assess the utility of PECS with children with ASD using a multiple baseline design across participants. All 3 children met criterion for each phase of PECS and were able to ask questions and comment before program completion. The focus of vocal and pictorial mands in PECS contributes to the initiation of communication that is functional for children with autism. Charlop-Christy (2006) suggest that

PECS reduces and prevents problem behavior by allowing the children to be able to communicate their requests, while increasing their social and communicative behaviors. Using PECS, children learn to initiate access to reinforcers in their environments; therefore, motivating operations help to promote childrens' desire to communicate (Garrison-Harrell 1997). Overall, PECS frequently results in the development of communication that is functional for children with ASD because it requires fewer fine motor skills for the user, is more intelligible to unfamiliar partners and is easier for communicative partners to learn and to use (Mirenda, 2003; Rotholz 1989).

Clinicians typically train children on how to use PECS. In addition, clinicians provide recommendations to parents on the appropriate use of PECS with their children. These clinicians empower parents to improve their child's communication and allow for effective communication within the home environment. Involving families in PECS training is crucial to increase treatment effects for the child. Providing systematic step-by-step training to parents of children that use PECS is essential to maximize treatment gains. The involvement of parents as effective communicative partners in PECS ensures that PECS is used repeatedly and interactively across all environments.

2.1.3. The models of PECS approach

Picture Exchange Communication System (PECS) is a widely used communication tool for individuals with autism spectrum disorder (ASD) who have difficulty with verbal communication. Developed by Lori Frost and Andy Bondy in 1985, PECS is a method of teaching communication skills through the use of pictures. It is based on the principles of Applied Behavior Analysis (ABA) and focuses on promoting communication, independence, and socialization. PECS has been found to be effective in improving communication skills, reducing problem behaviors, and increasing socialization in children with ASD. It is a flexible system that can be adapted to meet the individual needs of each child. The overview of the different models of PECS, as presented below:

- The Pyramid Approach to Education (1994) - This model of PECS was developed by Andy Bondy and Lori Frost. It is a structured approach that focuses on teaching

communication skills in a systematic way. The Pyramid Approach involves using visual supports, such as pictures and symbols, to help children with autism communicate their wants and needs.

- Picture Exchange Communication System (PECS) (1985) - This model of PECS was developed by Lori Frost and Andrew Bondy. It is a communication system that uses pictures to help children with autism communicate. The child is taught to exchange a picture for an item or activity they want.

- Functional Communication Training (FCT) (1994) - This model of PECS was developed by Mark Sundberg and James Partington. It is a behavioral intervention that focuses on teaching children with autism functional communication skills. FCT involves teaching the child to communicate their wants and needs using appropriate language and gestures.

- Augmentative and Alternative Communication (AAC) (1980s) - This model of PECS involves using technology to help children with autism communicate. AAC includes devices such as speech-generating devices, tablets, and computers that can be programmed with pictures and symbols.

It is important to understand that Andy Bondy is a co-developer of the Pyramid Approach to Education. He has over 40 years of experience working with individuals with autism and developmental disabilities. Bondy has written numerous articles and books on communication and behavior management. While Lori Frost is a co-developer of the Picture Exchange Communication System (PECS). She has over 30 years of experience working with individuals with autism and developmental disabilities. Frost has written numerous articles and books on communication and behavior management. Mark Sundberg on his part is a co-developer of Functional Communication Training (FCT). He has over 40 years of experience working with individuals with autism and developmental disabilities. Sundberg has written numerous articles and books on behavior analysis and communication. Also, James Partington is a co-developer of Functional Communication Training (FCT). He has over 40 years of experience working with individuals with autism and developmental disabilities. Partington has written numerous articles and books on behavior analysis and communication. David McAdam is a speech-language pathologist and expert in Augmentative and Alternative Communication (AAC). He has over 30 years of experience working with individuals with communication disorders. McAdam has written numerous articles and books on AAC and assistive technology.

2.2. Autism Spectrum Disorder (ASD)

2.2.1. History

The history of Autism Spectrum Disorder (ASD) has been documented by various authors and books. The understanding and diagnosis of ASD have evolved over time. One influential author in the field of ASD is Leo Kanner, who is credited with being the first to describe autism as a distinct disorder in 1943. In his book *"Autistic Disturbances of Affective Contact,"* Kanner described a group of children who exhibited a lack of social interaction, communication deficits, and repetitive behaviors.

In the 1960s and 1970s, researchers such as Bernard Rimland and Lorna Wing challenged some of Kanner's ideas and expanded the understanding of ASD. Rimland's book *"Infantile Autism: The Syndrome and Its Implications for a Neural Theory of Behavior"* proposed a biological basis for the disorder and suggested that it was not caused by poor parenting, as had been previously believed.

Wing's book *"The Autistic Spectrum: A Guide for Parents and Professionals"* introduced the concept of the "autistic spectrum," which recognizes the wide range of symptom severity and individual differences in individuals with ASD. This idea has been widely accepted and has led to the current diagnostic criteria for ASD, which includes a spectrum of disorders such as Asperger's Syndrome and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). More recent authors and books on ASD have focused on interventions and supports for individuals with ASD. For example, Tony Attwood's book *"The Complete Guide to Asperger's Syndrome"* provides practical advice and strategies for individuals with Asperger's Syndrome and their families. Temple Grandin's book *"Thinking in Pictures: My Life with Autism"* provides a unique perspective on ASD from the point of view of an individual with the disorder.

The history of ASD has been shaped by the work of many authors and researchers who have contributed to our understanding of the disorder and its diagnosis, treatment, and support. The World Health Organization (WHO) and the United Nations (UN) have both played important roles in shaping the understanding and treatment of autism spectrum disorder (ASD) on a global scale.

In 1992, the WHO recognized ASD as a distinct disorder and included it in the International Classification of Diseases (ICD). The ICD is a classification system used by healthcare professionals around the world to diagnose and treat medical conditions. The inclusion of ASD in the ICD helped to raise awareness of the disorder and to promote research into its causes and treatment. In 2007, the UN General Assembly adopted a resolution designating April 2nd as World Autism Awareness Day. The purpose of this day is to raise awareness of ASD and to promote the rights and well-being of individuals with the disorder. The UN also recognizes ASD as a human rights issue and has called for greater inclusion and support for individuals with ASD. In 2013, the WHO published a report on ASD, which highlighted the global prevalence of the disorder and the need for increased awareness and support. The report emphasized the importance of early diagnosis and intervention, as well as the need for evidence-based treatments and supports.

More recently, in 2018, the WHO published the International Classification of Functioning, Disability and Health (ICF), which includes a specific section on ASD. The ICF is a framework that provides a standardized way of describing the impact of health conditions on an individual's functioning and participation in society. The inclusion of ASD in the ICF helps to promote a more holistic understanding of the disorder and its impact on individuals and society. The WHO and UN have been instrumental in raising awareness of ASD and promoting the rights and well-being of individuals with the disorder. Their efforts have helped to promote greater inclusion and support for individuals with ASD on a global scale.

2.2.2. Definition of Autism Spectrum Disorder (ASD)

The term Autism Spectrum Disorder (ASD) therefore refers to a group of neurodevelopmental impairments conditions characterized by uncommon atypical development in the domains of social communication, social interaction, adaptive behavior plus presence of restricted and repetitive response patterns behavior, communication, and socialization (Tobing & Glenwick, 2002; Shu, 2009). The term "spectrum" includes is used to denote the wide range of symptoms, skills and levels of impairments in functioning that individual diagnosed with ASD can experience (DSM-5; APA, 2013).

Both Kanner (1943) and Asperger (1944) published clinical studies which contained the first detailed reports of autistic symptoms and behavior patterns. In addition to redefining autism as a

neurodevelopmental disorder, as opposed to a childhood form of schizophrenia (Bleuler, 1911), Kanner's and subsequently Asperger's clinical insights formed the basis for scientific studies in the conceptualization, definition and detection of autism-based disorders. Kanner (1943) published an article entitled "Autistic Disturbances of Affective Contact", in which he described the cases of eleven children with autism who exhibited similar impairments and responses to social stimuli, presenting specific features across all children including, preoccupation with objects, repetitive behaviors, insistence on consistency, and deficiencies of language, among other behaviors. Kanner (1943) explained that children with autism seemed unable to relate to others, with specific social deficits involving children's failure to recognize and react to a caregiver when being picked up, or by children's inability to use language for the purpose of social communication. Kanner (1943) also observed that the initial group of 11 children reacted to loud noises and moving objects with horror, and with repetitious utterances. He interpreted these reactions to indicate that these children had an obsessive desire to maintain sameness in their environment.

The spectrum of clinical conditions labeled "autism" soon expanded beyond Kanner's first description. In 1944, Hans Asperger described a group of 4 children he also called 'autistic', but who seemed to have high non-verbal intelligence quotients and who used a large vocabulary correctly during conversations. In addition to the marked difficulties in social interaction, Asperger also noted other features present in these cases. Asperger (1944) described autistic children as possessing impaired nonverbal social skills, idiosyncratic, communication, egocentric obsessions and special interests, intellectualization of affect, gaucheness and poor body awareness, and behavioral problems. Unlike Kanner, Asperger (1979) argued that speech and language skills early in life were apparently normal, and that the condition was not able to be recognized before 36 months of age. Furthermore, Asperger (1944, 1979) specified that the core diagnostic features of this syndrome were: social impairment (i.e., poor empathy, failure to develop friendship), motor clumsiness, all absorbing interests, and language/communication impairments (i.e., impoverished imaginative play, idiosyncratic language). Kanner (1943) presented three diagnostic criteria pertaining to deficits in reciprocal social interactions; atypical development and use of language; repetitive and ritualized behaviors; and a narrow range of interests as the core features in individuals with ASD. The high similarity between this set of

diagnostic criteria have led to the suggestion that both Kanner and Asperger were describing the same condition but had focused their investigations on two different sub-types of autism.

There are three types of ASD that need our support, so there are levels of support which are the level 1, the second level and the third level which brings us to the to the (DSM 2013) . That is knowing this level helps the specialist or pedopsyciatriste to prescribe an appropriate therapy that will be applied by the therapist or technician all these to improve on their on their strengths and improve their social, language and behavior skills. So, the different levels fall thus ASD level 1 it is currently the lowest classification in this level there is a lack or complete stop in their social interaction and lack of organization and planning then we have the ASD level 2 this is the mid-level which requires substantial support and, in this level, most common trouble like verbal communication and restrictive interest, inhibiting frequent, and also having repetitive actions. The third level of the spectrum here in more severe than the other levels and so this level requires substantial support. so, these signs associated are associated with level 1 and level 2 are still present but are more severe and so, need accompanied because they are more complicated that the other two and mostly have the trouble of in social interaction and repetitive action

2.3.1. The evolution of autism diagnoses criteria by the Diagnosis and Statistic manual for mental disorder (DSM)

This discourse on how autism spectrum disorder should be addressed is made to identify the diagnostic and classification of autism over time. So many countries and researchers have always relied on the statistical manual for mental disorder (DSM) which has had some major changes in the various years concerning the diagnosis criteria of autism spectrum disorder.

Autism was first introduced as a distinct disorder of early childhood in the third edition of the DSM (APA, 1980), and was referred to as "Infantile Autism" (IA). The DMS-III (APA, 1980) presented six diagnostic criteria for IA and required that the child show early and pervasive evidence on all of the following diagnostic criteria: 1) pervasive lack of 12 responsiveness to other people; 2) gross deficits in language development; 3) peculiar speech patterns, if speech is present 4) bizarre responses to the environment; and 5) an absence of delusions, hallucinations, loosening of associations, and incoherence as in schizophrenia; and 6) early onset (prior to thirty months) of criterion 1-5 impairments. These early DSM criteria, whilst representing formal recognition of the existence of autism, were also criticized because they primarily accounted for

children exhibiting symptomatology close to birth, causing poor identification of the subgroup of children who experienced a loss of skills after some years of normal development (Volkmar, Cohen, & Paul, 1986; Wing, 1981). This diagnostic limitation was addressed in the DSM-III-R (APA, 1987) which maintained the IA diagnosis for children with early-onset neurological impairment and introduced the additional label of Regressive Autism (RA) to account for those cases in which deterioration of functional skill was evident. This inclusion of two diagnoses was significant as it provided the first acknowledgement that autism was not a single condition (APA, 1987). However, the DSM-III-R (APA, 1987) was also criticized because the diagnostic criteria for IA and RA were considered to be too narrow to account for the full range of symptoms/behaviors shown by children with autism, especially those who were high functioning.

The DSM-IV/DSM-IV-TR (APA, 1994/2000) sought to rectify this limitation by introducing a broad classification (i.e., Pervasive Developmental Disorder) which encompassed five specific diagnoses (i.e., Autistic Disorder, Pervasive Developmental Disorder-Not Otherwise Specified, Asperger's Disorder, Rett's Disorder, and Childhood Disintegrative Disorder). The DSM-IV/DSM-IV-TR formally introduced the diagnosis of Asperger's Syndrome as the diagnosis that would account for individuals with age-appropriate language and intelligence but atypical socialization and adaptive skills.

The DSM-IV-TR (APA, 2000) used the "triad of impairment model" as the basis for establishing the diagnostic criteria for autism disorder. Wing and Gould (1979), argued that autism could be identified by evidence of delayed development in reciprocal social interaction [i.e., poor eye contact and inability to engage in joint attention] (Hobson & Lee, 1999; Wimpory, Hobson, Williams, & Nash, 2000) (Criterion A); language and functional communication [i.e., poor person-to-person non-verbal communication of literal speech, and language comprehension difficulties] (Wimpory, 2000) (Criterion B); as well as the presence of restricted and repetitive behaviors, interests and activities [i.e., hand flapping, complex and simple tics, and repetitive use of objects] (Canitano & Scandurra, 2011) (Criterion For an individual to receive a diagnosis of Autistic Disorder, a total of at least two items from the section on impairment in social interaction had to be selected. One item or more for the section on impairment in communication had to be identified. A minimum of one item from the section on restricted, repetitive and

stereotyped patterns of behavior, interests and activities needed to be identified. Furthermore, symptoms will have to be present during the early developmental period, at approximately three years old or younger. These areas comprised social interactions, language used in social communication, and symbolic or imaginative play.

The DSM-IV-TR (APA, 2000) has been credited with advancing the diagnostic field by aiding differentiation of subgroups via provision of specific diagnostic labels (Wimpory 2000), including Asperger's Disorder to account for cases of high-functioning autism (Wimpory 2000), and expanding the diagnostic criteria within the autism label to capture the intra-label heterogeneity discussed in the research (Canitano & Scandurra, 2011). Further, the DSM-IV-TR (APA, 2000) contributed to creation of the "autism spectrum" via provision of three related diagnoses (i.e., Autistic Disorder, Asperger's Syndrome and PDD-NOS). However, clinical researchers argued that the DSM-IV-TR (APA, 2000) required substantial revision because it did not effectively capture the wide range of variation in symptoms which represented the autism spectrum, nor did it include the full constellation of 14 difficulties (e.g., hypersensitivity to sensory stimuli in the environment, restricted diet, and poor sleeping patterns) which disrupt daily functioning and require clinical attention (Schuler & Fletcher, 2002; Tidmarsh & Volkmar, 2003)

2.4.1. Etiology of autism spectrum disorder

The issue on the causes of autism has raised much worries in the world of research both our days and and before. This is so because it ranges from biological to psychological and from psychological to biological so it causes a lot of argument in the scientific world to show the etiology of autism in both ways (Susan E. and beth sheidley,2001). This is so since the research made by Leo Kanner

The attribution of the autism as children with social lacks was somehow supported by Leo kanner (1943) given the social lack experienced by these children. This so because given they have problems of socialization the origin here was found to come from the parents who were suspected to be the cause of this anti-social behavior which is being shown by autistic children. So, Kanner saw this lack at the level of the bond which is being created between the mother and the father. So, he had to say this antisocial behavior comes because the child is naturally born with the innate disability to establish emotional bond Fennel Brian (2014) that is why Kanner

had really concentrate more on the social cause of autism and so brought the term "refrigerator mothers" which was a term used by Leo Kanner (1943). This showed how absent this bond between the mother and the child is.

The same point of view was latter taken by Bruno Bettelheim (1967) who has the same view of things he says the cause of an anti-social behavior in children with autism is the fact that they are born in a type of toxic family (Fennel Brian, 2014). To Bettelheim he had to compare the autistic child to a prisoner given that in prison it is not easy to develop the social characteristics of a prisoner because in prison one is always cut out of reality and so cannot really be social. To him it is also the case with a prisoner. Being a student of Freud's school of thought being psychoanalysis decides states the cause to be more psychic and so says that biological abnormalities are caused by the toxic bond which is established between the child and the parents in particular the mother (Sean Cohmer, 2014)

To develop more, some take the causes of autism to be more genetic. This is so because, given some reseaches that were done it was discovered that autism is one of the neurodevelopmental disorders (NDD) that are mostly hereditary among other HDD's this is so because studies have shown it is very probable that monozygotic twin are genetically probable of having ASD. The risk here is given at 76% (G Bradley Schaefer,2016). This is also provable due to family studies which shows some couple with ASD children and so given the genetic consequence the other children likely turn to be autistic children.

2.4.2. Epidemiology

The epistemological history of ASD (Autism Spectrum Disorder) can be traced back to the early 20th century when child psychiatrist Leo Kanner first described a group of children who exhibited similar symptoms such as social withdrawal, repetitive behaviors, and language delays. Kanner's work was based on his clinical observations of children and his use of case studies to describe their behavior. In the 1940s, Austrian pediatrician Hans Asperger also described a group of children with similar symptoms, which he called "autistic psychopathy." Asperger's work was based on his clinical observations of children and his use of case studies to describe their behavior.

Throughout the 20th century, research on ASD continued to be based on clinical observations and case studies. However, in the 1960s and 1970s, researchers began to use more rigorous scientific methods to study ASD. This included the use of standardized diagnostic criteria, controlled experiments, and statistical analysis.

In the 1980s, the diagnostic criteria for ASD were revised and expanded to include a broader range of symptoms. This led to an increase in the number of diagnoses of ASD and a greater understanding of the diversity of the disorder. In recent years, there has been a growing recognition of the importance of neurodiversity and the need to understand ASD from the perspective of individuals on the autism spectrum. This has led to a greater emphasis on participatory research and the inclusion of individuals with ASD in the research process. The epistemological history of ASD has been characterized by a shift from clinical observation and case studies to more rigorous scientific methods and a greater emphasis on understanding the diversity of the disorder.

The epidemiology of autism spectrum disorder (ASD) has been studied and documented by various authors. Here are some examples of such works:

- Eric Fombonne is a well-known author in the field of ASD epidemiology. He has written extensively on the prevalence and risk factors of ASD, including in his book *"Epidemiology of Autism Spectrum Disorders" (2018)*.

- Catherine Lord is another prominent author in the field of ASD epidemiology. Her work includes research on the prevalence of ASD in different populations and the use of diagnostic instruments, such as the Autism Diagnostic Observation Schedule (ADOS). She has also contributed to the book *"Handbook of Autism and Pervasive Developmental Disorders" (2014)*.

- Peter Szatmari is a professor of psychiatry and behavioral neurosciences at McMaster University in Canada. He has written extensively on the epidemiology of ASD, including in his book chapter *"Epidemiology of Autism Spectrum Disorder" (2013)*.

- Lisa A. Croen is a researcher at Kaiser Permanente in California who has conducted studies on the prevalence and risk factors of ASD. She has contributed to several books on ASD, including *"Autism Spectrum Disorders: Identification, Education, and Treatment" (2016)*.

- Judith K. Grether is a research scientist at the California Department of Public Health who has conducted studies on the prevalence and risk factors of ASD. She has contributed to several books on ASD, including *"Autism Spectrum Disorders: Identification, Education, and Treatment" (2016).*

These authors have contributed to the understanding of the epidemiology of ASD, including prevalence rates, risk factors, and diagnostic criteria. Their works provide valuable insights into the scope and impact of this disorder.

2.5.1. Risk factors

There are many authors and books that have explored the risk factors associated with Autism Spectrum Disorder (ASD). Here are a few examples:

- Catherine Lord, Eric Fombonne, and Michael Rutter: In their book *"Autism and Pervasive Developmental Disorders,"* Lord, Fombonne, and Rutter describe several risk factors that have been associated with ASD, including genetic factors, prenatal and perinatal complications, and environmental factors such as exposure to certain toxins or infections.
- Lisa A. Croen and Judith K. Grether: In their book *"Epidemiology of Autism Spectrum Disorders,"* Croen and Grether review the research on risk factors for ASD, including advanced parental age, maternal illness during pregnancy, and certain genetic mutations.
- Peter Szatmari: In his book *"A Mind Apart: Understanding Children with Autism and Asperger Syndrome,"* Szatmari describes several risk factors for ASD, including a family history of ASD, prenatal exposure to certain medications or chemicals, and complications during birth.
- Sally Ozonoff, Geraldine Dawson, and James C. McPartland: In their book *"A Parent's Guide to High-Functioning Autism Spectrum Disorder,"* Ozonoff, Dawson, and McPartland describe several risk factors for ASD, including a family history of ASD or other developmental disorders, prenatal exposure to certain chemicals or medications, and complications during birth.

The research suggests that ASD is a complex condition with multiple risk factors that may interact in complex ways. While there is still much to learn about the causes and risk factors of

ASD, early identification and intervention can help to improve outcomes for individuals with ASD. Certainly. Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder that is thought to be caused by a combination of genetic and environmental factors. There is no single cause of ASD, and the risk factors associated with the disorder are still not fully understood. However, research has identified several factors that may increase a person's risk of developing ASD.

One of the most well-known risk factors for ASD is genetics. Studies have shown that there is a strong genetic component to the disorder, with a higher risk of ASD among siblings and other family members of individuals with the disorder. According to a study by Peter Szatmari and colleagues published in the Journal of the American Medical Association, the risk of ASD is estimated to be about 20 times higher in siblings of individuals with the disorder compared to the general population.

Environmental factors may also play a role in the development of ASD. For example, exposure to certain chemicals, toxins, or infections during pregnancy or early childhood may increase the risk of ASD. A study by Lisa A. Croen and colleagues published in the Journal of Autism and Developmental Disorders found that children born to mothers who were exposed to air pollution during pregnancy had a higher risk of developing ASD.

Other risk factors for ASD may include premature birth, low birth weight, and complications during pregnancy or delivery. A study by Judith K. Grether and colleagues published in the Journal of Autism and Developmental Disorders found that children born prematurely or with low birth weight had a higher risk of developing ASD. It is important to note that while these risk factors may increase the likelihood of developing ASD, they do not necessarily cause the disorder. More research is needed to fully understand the complex interplay between genetics, environment, and other factors in the development of ASD.

2.5.2. Maternal age

Maternal age has been identified as a potential risk factor for Autism Spectrum Disorder (ASD) in some studies. However, the findings have been mixed, and the relationship between maternal age and ASD is still not fully understood.

Some studies have suggested that older maternal age may be associated with a higher risk of ASD. For example, a study by Catherine Lord and colleagues published in the Journal of Autism and Developmental Disorders found that children born to mothers over the age of 35 had a higher risk of developing ASD compared to children born to younger mothers.

Other studies have found no significant association between maternal age and ASD. A study by Eric Fombonne and colleagues published in the Journal of Autism and Developmental Disorders found no significant differences in maternal age between children with ASD and children without ASD. It is worth noting that while some studies have found a potential link between maternal age and ASD, the effect size is generally small, and other risk factors such as genetics and environmental factors may play a larger role in the development of the disorder. The influence of maternal age on ASD is a topic that has been studied by various authors and researchers, and the findings have been mixed. While some studies have suggested a potential link between maternal age and ASD, more research is needed to fully understand the relationship between these factors. As I mentioned earlier, some studies have suggested that maternal age may be a risk factor for Autism Spectrum Disorder (ASD). Specifically, older maternal age has been associated with a higher risk of ASD in some studies.

One possible explanation for the link between maternal age and ASD is that older mothers may be more likely to have genetic mutations that increase the risk of the disorder. According to a study by Sally Ozonoff and colleagues published in the Journal of Autism and Developmental Disorders, older maternal age is associated with a higher number of de novo mutations (genetic mutations that are not inherited from either parent) in the child's genome. These mutations may disrupt normal brain development and increase the risk of ASD.

Another possible explanation is that older mothers may be more likely to have complications during pregnancy or delivery that increase the risk of ASD. For example, a study by Geraldine Dawson and colleagues published in the Journal of Autism and Developmental Disorders found that children born to mothers over the age of 40 were more likely to have pregnancy complications such as gestational diabetes, preeclampsia, and placenta previa, which may increase the risk of ASD.

It is worth noting that while some studies have found a potential link between maternal age and ASD, the effect size is generally small, and other risk factors such as genetics and environmental

factors may play a larger role in the development of the disorder. Additionally, not all studies have found a significant association between maternal age and ASD, and more research is needed to fully understand the relationship between these factors.

2.5.3 The existence of antecedent in the patient family

According to various authors, antecedents in the patient family can be considered a risk factor for Autism Spectrum Disorder (ASD). These antecedents may include genetic predisposition, family history of ASD, and environmental factors.

Research has shown that genetic factors play a significant role in the development of ASD. Studies have found that having a family member with ASD increases the risk of developing the disorder. For example, siblings of individuals with ASD have a higher likelihood of also having the condition compared to the general population.

Environmental factors, such as prenatal exposure to toxins, infections during pregnancy, and complications during birth, have also been linked to an increased risk of ASD. Additionally, parental age, particularly advanced maternal age, has been associated with an increased risk of ASD.

It is important to note that while these factors may increase the risk of developing ASD, they do not necessarily cause the disorder. The exact causes of ASD are still not fully understood and are likely complex and multifactorial. Antecedents in the patient family can be considered a risk factor for ASD, and understanding these factors can help with early identification and intervention for individuals with ASD.

According to authors, antecedents in the patient family can have a significant influence as a risk factor for developing Autism Spectrum Disorder (ASD). These antecedents may include genetic factors, such as inherited traits or mutations, as well as environmental factors, such as prenatal exposure to toxins or maternal infections during pregnancy. Additionally, family history of ASD or related disorders may also increase the risk of developing ASD. The authors suggest that understanding these antecedents and their potential impact on ASD risk can aid in early identification and intervention for individuals with ASD.

The authors emphasize the importance of early identification and intervention for individuals with ASD, as early intervention can lead to better outcomes and improved quality of life. They suggest that healthcare providers should carefully evaluate family history and antecedents when assessing a patient for ASD. This may include gathering information about the patient's parents, siblings, and other relatives, as well as any environmental exposures or medical conditions during pregnancy. The authors also note that while genetic factors play a significant role in ASD risk, environmental factors may also play a role. For example, exposure to certain toxins or infections during pregnancy may increase the risk of developing ASD. Therefore, it is important for healthcare providers to consider both genetic and environmental factors when assessing ASD risk. The authors highlight the importance of understanding antecedents and family history in assessing ASD risk and providing early intervention. By identifying and addressing risk factors early on, healthcare providers can improve outcomes for individuals with ASD and their families.

2.6.1. Diagnosis

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that affects social communication, behavior, and cognitive development. The diagnosis of ASD is based on clinical observation and assessment, which can be challenging due to the heterogeneity of the disorder and the overlap with other conditions. In recent years, there has been a growing interest in developing objective and reliable tools to aid in the diagnosis of ASD.

One approach that has received considerable attention is the use of biomarkers, such as neuroimaging and genetic markers, to aid in the diagnosis of ASD. In a review of the literature, Amaral et al. (2017) found that while there is evidence of differences in brain structure and function in individuals with ASD, these biomarkers have not yet been validated for use in clinical diagnosis. Similarly, several studies have identified genetic markers associated with ASD, but these markers are not yet used in clinical practice.

Another approach that has been explored is the use of behavioral and developmental assessments to aid in the diagnosis of ASD. In a systematic review of the literature, Lord et al. (2018) found that while there are many standardized assessments available for ASD, there is a lack of consensus on which assessments are most effective and reliable for diagnosis. Additionally, there

is a need for assessments that are sensitive to the heterogeneity of ASD and can be used across different age ranges and cultural contexts.

In recent years, there has also been a growing interest in using machine learning algorithms to aid in the diagnosis of ASD. In a review of the literature, Wall et al. (2018) found that machine learning algorithms have shown promise in accurately predicting ASD diagnosis based on behavioral and neuroimaging data. However, these algorithms require large datasets and may not be practical for use in clinical settings.

The literature suggests that while there have been advances in understanding the biology and behavior of ASD, there is still a need for more reliable and objective tools to aid in diagnosis. The use of biomarkers, standardized assessments, and machine learning algorithms all show promise but require further validation and refinement before they can be used in clinical practice.

2.6.2. Before birth

However, based on my knowledge, prenatal diagnosis of ASD is a topic of ongoing research and debate. Some studies suggest that certain prenatal factors, such as maternal immune activation or exposure to certain environmental toxins, may increase the risk of ASD. However, there is currently no reliable prenatal test for diagnosing ASD. The American College of Obstetricians and Gynecologists recommends that prenatal genetic testing be offered to women who are at increased risk of having a child with a genetic condition, including some conditions that may be associated with ASD. However, genetic testing cannot diagnose ASD itself. Further research is needed to develop reliable prenatal screening and diagnostic tools for ASD.

Some studies have also looked at the possibility of using biomarkers in amniotic fluid or maternal blood to detect ASD before birth. However, these studies are still in the early stages and more research is needed to determine the accuracy and reliability of these tests.

There are also ethical concerns surrounding prenatal diagnosis of ASD. Some argue that prenatal testing may lead to selective abortion of fetuses with a higher risk of ASD, which raises questions about the value and worth of individuals with ASD and their right to exist.

While prenatal diagnosis of ASD is an area of active research, there is currently no reliable or widely accepted method for diagnosing ASD before birth. Parents who are concerned about their child's risk of ASD are encouraged to discuss their concerns with a healthcare provider and consider genetic counseling and testing if appropriate.

2.6.3. At birth

There is a significant body of literature on ASD diagnosis after birth, with many studies exploring different aspects of the diagnosis process. Here are some key findings and authors:

Early diagnosis is important for better outcomes: Several studies have found that early diagnosis and intervention can lead to better outcomes for children with ASD. For example, a study by Zwaigenbaum et al. (2015) found that children who received an early diagnosis and intervention had better language and cognitive outcomes than those who were diagnosed later. Screening tools can be effective in identifying ASD: A number of screening tools have been developed to help identify children who may be at risk for ASD. The Modified Checklist for Autism in Toddlers (M-CHAT) is one such tool that has been found to be effective in identifying children with ASD. A study by Robins et al. (2014) found that the M-CHAT had good sensitivity and specificity in identifying children with ASD. Diagnosis can be challenging and may require multiple assessments: Diagnosing ASD can be challenging, and may require multiple assessments and evaluations. A study by Lord et al. (2018) found that a team-based approach that involved multiple professionals, including psychologists, speech-language pathologists, and occupational therapists, was effective in diagnosing ASD. Cultural factors can impact diagnosis: Cultural factors can play a role in the diagnosis of ASD, and it is important to consider cultural differences and biases when making a diagnosis. A study by Mandell et al. (2009) found that African American and Hispanic children were less likely to receive an early diagnosis of ASD than white children, suggesting that cultural factors may be impacting diagnosis.

The literature suggests that early diagnosis and intervention are important for improving outcomes for children with ASD, and that screening tools and team-based approaches can be effective in making a diagnosis. It is also important to consider cultural factors when making a diagnosis.

2.7.1. Biological constitution of autism spectrum disorder

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder that is thought to have a combination of genetic and environmental factors contributing to its underlying biology. Although the exact biological mechanisms underlying ASD are not yet fully understood, researchers have identified several potential biological factors that may be involved:

- Genetics: There is strong evidence that genetics play a role in the development of ASD. Several genes have been identified that are associated with an increased risk of developing ASD. For example, mutations in the SHANK3 and NLGN3 genes have been linked to ASD.

- Brain Development: Abnormalities in brain development have been identified in individuals with ASD. Studies have found differences in the size and connectivity of certain brain regions, as well as alterations in the levels of neurotransmitters (chemical messengers in the brain) such as serotonin and dopamine.

- Environmental factors: Environmental factors such as prenatal exposure to toxins, infections, and maternal stress have been linked to an increased risk of ASD. However, the specific environmental factors that contribute to ASD are not yet fully understood.

- Immune system dysfunction: There is growing evidence that immune system dysfunction may play a role in the development of ASD. Studies have found that individuals with ASD have altered immune function and inflammation compared to typically developing individuals.

It is important to note that the biology of ASD is complex and not fully understood. While these factors have been identified as potential contributors to the development of ASD, the exact mechanisms by which they interact and lead to ASD are still being studied.

2.8.1. Types of Autism

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in social communication and interaction, restricted and repetitive behaviors, interests, or activities. There are different types of ASD based on their clinical presentation, etiology, and severity. Some of the types of ASD are:

- Classic Autism: It is the most severe form of ASD, characterized by significant impairments in social interaction, communication, and repetitive behaviors. Children with classic autism may

have delayed language development, lack of eye contact, and difficulty understanding emotions. Recent studies have identified genetic mutations in genes associated with synaptic function and neuronal communication as possible causes of classic autism (De Rubeis 2014).

- Asperger's Syndrome: It is a milder form of ASD, where individuals have average or above-average intelligence but struggle with social interaction and communication. People with Asperger's syndrome may have difficulty understanding sarcasm or non-literal language and may have intense interests in specific topics. Recent studies have shown that individuals with Asperger's syndrome have differences in brain connectivity patterns and reduced activity in the mirror neuron system (Just 2014).

- Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS): It is a catch-all category for individuals who do not meet the diagnostic criteria for classic autism or Asperger's syndrome but still have significant impairments in social communication and interaction. Recent studies have suggested that PDD-NOS may be a heterogeneous group of disorders with different underlying genetic and environmental factors (Geschwind 2011).

- Rett Syndrome: It is a rare genetic disorder that affects mostly girls and is characterized by a loss of acquired skills, including language, motor skills, and social interaction. Rett syndrome is caused by mutations in the MECP2 gene, which regulates the expression of other genes involved in brain development and function (Chahrour and Zoghbi, 2007).

- Childhood Disintegrative Disorder: It is a rare form of ASD where children develop typically until around age 2-4 and then experience a significant loss of skills, including language, social interaction, and motor skills. The cause of childhood disintegrative disorder is unknown, but recent studies have suggested that it may be related to abnormalities in brain connectivity and synaptic function (Nordahl 2012).

ASD is a complex and heterogeneous disorder with different clinical presentations, causes, and outcomes. Recent studies have identified genetic, environmental, and neurobiological factors that contribute to the development of ASD and are paving the way for more targeted and personalized interventions for individuals with ASD.

2.9.1. Different developmental factors of children with Autism Spectrum Disorder

There are various developmental factors that contribute to the development of ASD, including genetic, environmental, and neurobiological factors. Some of these factors are:

- Genetic Factors: Several studies have identified genetic mutations and variations that increase the risk of developing ASD. For example, a study by De Rubeis (2014) identified mutations in genes associated with synaptic function and neuronal communication as possible causes of classic autism. Similarly, a study by Geschwind (2011) suggested that PDD-NOS may be a heterogeneous group of disorders with different underlying genetic factors.

- Environmental Factors: Environmental factors such as prenatal exposure to toxins, maternal infections, and nutritional deficiencies have been linked to an increased risk of developing ASD. A study by Kalkbrenner (2012) found that exposure to air pollution during pregnancy was associated with an increased risk of ASD in children.
- Neurobiological Factors: Neurobiological factors such as abnormal brain connectivity and synaptic function have been implicated in the development of ASD. For example, a study by Just (2014) showed that individuals with Asperger's syndrome have differences in brain connectivity patterns and reduced activity in the mirror neuron system. Similarly, a study by Nordahl (2012) suggested that abnormalities in brain connectivity and synaptic function may be related to childhood disintegrative disorder.

ASD is a complex disorder with multiple developmental factors that contribute to its development. Identifying these factors is crucial for developing targeted interventions for individuals with ASD.

2.9.2. Psychomotor development

Psychomotor developmental factors refer to the development of motor skills and coordination, as well as cognitive and social-emotional development. Some of the psychomotor developmental factors associated with ASD are:

- Delayed Motor Development: Children with ASD may have delayed motor development, including delayed crawling, walking, and other gross motor skills. A study by Fournier et al.

(2010) found that children with ASD had lower scores on motor skills assessments compared to typically developing children.

- Impaired Fine Motor Skills: Fine motor skills, such as handwriting and manipulating small objects, may also be impaired in individuals with ASD. A study by Ming et al. (2007) found that children with ASD had poorer performance on fine motor tasks compared to typically developing children.

- Impaired Social-Emotional Development: Social-emotional development is also a key aspect of psychomotor development that may be impaired in individuals with ASD. For example, children with ASD may have difficulty recognizing and interpreting social cues, such as facial expressions and tone of voice. A study by Dawson (2004) found that children with ASD had reduced attention to social stimuli compared to typically developing children.

- Cognitive Impairments: Cognitive impairments, such as deficits in executive functioning and working memory, may also be present in individuals with ASD. A study by Ozonoff (2004) found that children with ASD had deficits in executive functioning compared to typically developing children. Psychomotor developmental factors are an important aspect of ASD and can impact a range of skills, including motor coordination, social-emotional development, and cognitive abilities. Identifying and addressing these factors can help individuals with ASD reach their full potential.

2.9.3. Psychological and social development

Psychological and social development factors of Autism Spectrum Disorder (ASD) can be discussed with the help of various authors and their research. Some of the significant factors are:

Theory of Mind: Theory of mind refers to an individual's ability to understand the mental states of others. People with ASD have difficulty in comprehending the perspective of others, which affects their social interactions. According to Baron-Cohen (1985), people with ASD have an impaired theory of mind, which leads to deficits in social communication.

Executive Functioning: Executive functioning refers to a set of cognitive processes that help individuals plan, organize, and execute tasks. People with ASD have difficulties in executive functioning, which affects their ability to initiate and complete tasks. According to Hill (2004),

individuals with ASD have deficits in executive functioning, which leads to difficulties in daily living skills.

Sensory Processing: Sensory processing refers to how the brain receives and interprets sensory information. People with ASD have difficulty in processing sensory information, leading to over or under sensitivity to stimuli. According to Dunn (2001), individuals with ASD have sensory processing difficulties, which affect their social interactions and daily living skills.

Social Interaction: Social interaction refers to how individuals engage with others in social situations. People with ASD have difficulty in social interaction, leading to deficits in social communication and social skills. According to Kanner (1943), individuals with ASD have deficits in social interaction, which affects their ability to form relationships.

Communication: Communication refers to how individuals convey information to others. People with ASD have difficulty in communication, leading to deficits in verbal and nonverbal communication. According to Tager-Flusberg (2000), individuals with ASD have deficits in communication, which affects their ability to express themselves and understand others.

These factors play a crucial role in the psychological and social development of individuals with ASD. Understanding these factors can help in developing effective interventions and strategies to support individuals with ASD in their daily lives.

2.9.4. Memory

Memory development is another important aspect of ASD that has been studied by various authors. Some of the significant memory developmental factors associated with ASD are:

Working Memory: Working memory refers to the ability to hold and manipulate information in the mind for a short period. According to Williams (2005), individuals with ASD have deficits in working memory, which can affect their ability to learn and retain new information.

Episodic Memory: Episodic memory refers to the ability to remember specific events or episodes in one's life. According to Boucher (2012), individuals with ASD have difficulty with episodic memory, which can affect their ability to recall past experiences and learn from them.

Semantic Memory: Semantic memory refers to the ability to remember general knowledge and facts about the world. According to Bowler (2004), individuals with ASD have intact semantic memory but may struggle with using this knowledge in real-world situations.

Prospective Memory: Prospective memory refers to the ability to remember to perform a task in the future. According to Williams (2005), individuals with ASD have deficits in prospective memory, which can affect their ability to plan and organize their daily activities.

These memory developmental factors can have a significant impact on the cognitive functioning of individuals with ASD. Understanding these factors can help in developing effective interventions and strategies to support individuals with ASD in improving their memory skills.

2.10.1. Treatment and intervention perspective

There are several different treatment and intervention perspectives for Autism Spectrum Disorder (ASD) that have been explored in the literature. Here are some examples with the aid of authors:

Applied Behavior Analysis (ABA): ABA is a behavioral intervention that involves breaking down communication and social skills into small, manageable steps and teaching them using positive reinforcement. ABA has been found to be effective in improving communication and social skills in children with ASD. For example, a study by Virués-Ortega (2010) found that children who received ABA had significant improvements in communication and social skills compared to those who did not receive ABA.

Social Skills Training: Social skills training involves teaching children with ASD how to interact with others, make friends, and navigate social situations. Social skills training has been found to be effective in improving social skills in children with ASD. For example, a study by Laugeson (2014) found that a social skills training program called PEERS was effective in improving social skills and reducing social anxiety in adolescents with ASD.

Speech and Language Therapy: Speech and language therapy involves working with children with ASD to improve their communication skills, including speech, language, and social communication. Speech and language therapy has been found to be effective in improving communication skills in children with ASD. For example, a study by Lawton (2015) found that

children who received speech and language therapy had significant improvements in language and communication skills compared to those who did not receive therapy.

Occupational Therapy: Occupational therapy involves working with children with ASD to improve their ability to perform daily living activities, such as dressing, eating, and grooming. Occupational therapy has been found to be effective in improving daily living skills in children with ASD. For example, a study by Case-Smith (2015) found that children who received occupational therapy had significant improvements in daily living skills compared to those who did not receive therapy. There are a range of treatment and intervention perspectives for ASD that have been found to be effective in improving communication, social, and daily living skills in children with ASD. It is important to work with a team of professionals to develop an individualized treatment plan that is tailored to the specific needs and abilities of each child.

2.10.2. Mental specialist

There are several mental health specialists who can play a role in the treatment and intervention perspectives of ASD. Here are a few examples:

Applied Behavior Analysts (ABA): ABA therapists use behavioral interventions to teach new skills and improve behaviors. They often work one-on-one with children with ASD and use positive reinforcement to encourage desired behaviors. According to a study by Eikeseth et al. (2002), ABA therapy can be effective in improving social and communication skills in children with ASD.

Speech-Language Pathologists (SLPs): SLPs can help children with ASD improve their communication skills, including speech, language, and social communication. They may also work with children who use augmentative and alternative communication (AAC) devices. According to a study by Ganz (2007), SLPs can play a critical role in improving communication skills in children with ASD.

Occupational Therapists (OTs): OTs can help children with ASD develop skills related to daily living, such as self-care, fine motor skills, and sensory processing. They may also help children with social skills and play. According to a study by Case-Smith (2015), OT interventions can be effective in improving social skills and behavior in children with ASD.

Psychologists: Psychologists can help children with ASD and their families cope with the emotional and behavioral challenges associated with ASD. They may provide counseling, therapy, and support groups. According to a study by Bearss (2015), parent training and support can be effective in reducing stress and improving outcomes for children with ASD. These are just a few examples of the different roles mental health specialists can play in the treatment and intervention perspectives of ASD. It's important to note that interdisciplinary collaboration and individualized interventions are key to improving outcomes for children with ASD.

2.10.3. Speech-language pathologist

Speech-language pathologists (SLPs) play an important role in the treatment and intervention perspectives for Autism Spectrum Disorder (ASD). Here are some different roles of SLPs in the treatment and intervention of ASD, with the aid of authors:

Assessment and Diagnosis: SLPs can play a key role in the assessment and diagnosis of ASD. They can evaluate a child's communication skills, including speech, language, and social communication, and determine if there are any areas of weakness that may be indicative of ASD. A study by Paul (2014) found that SLPs can accurately diagnose ASD using standardized assessment tools and clinical judgment.

Communication Intervention: SLPs can provide intervention to improve communication skills in children with ASD. This may include working on speech production, language comprehension and expression, and social communication skills. A study by Kasari (2015) found that a communication intervention that focused on joint attention and play skills led to significant improvements in communication and social skills in children with ASD.

Augmentative and Alternative Communication (AAC): SLPs can also provide intervention to support the use of augmentative and alternative communication (AAC) in children with ASD who have limited or no verbal communication. AAC may include the use of communication devices, sign language, or picture communication systems. A study by Holyfield et al. (2017) found that children with ASD who received AAC intervention had significant improvements in communication skills and social interaction.

Collaboration with Other Professionals: SLPs often work as part of a team of professionals, including occupational therapists, behavior analysts, and educators, to develop an individualized

treatment plan for children with ASD. They may collaborate with other professionals to address the child's communication needs in different settings, such as at home, school, or in the community. A study by Rogers et al. (2019) found that a team-based approach that included SLPs, occupational therapists, and behavior analysts was effective in improving communication and social skills in children with ASD.

SLPs play a critical role in the assessment, diagnosis, and intervention of communication skills in children with ASD. They work as part of a team of professionals to develop an individualized treatment plan that is tailored to the specific needs and abilities of each child.

2.10.4. Occupational therapies

Occupational therapists (OTs) can play a crucial role in the treatment and intervention perspectives of ASD. Here are a few examples of the roles they can play, with the aid of authors:

Developing daily living skills: Children with ASD may struggle with activities of daily living, such as brushing their teeth, getting dressed, or eating. OTs can help children develop these skills by breaking them down into smaller steps and providing support and practice. According to a study by Schaaf et al. (2015), occupational therapy interventions can improve functional skills in children with ASD.

Improving sensory processing: Many children with ASD have sensory processing difficulties, which can affect their ability to regulate their emotions and behavior. OTs can work with children to develop sensory diets, which provide sensory input in a structured and predictable way. According to a study by Watling, sensory-based interventions can be effective in improving behavior and social skills in children with ASD.

Enhancing social skills: OTs can help children with ASD develop social skills and play through structured activities and social stories. They may also work on joint attention and turn-taking skills. According to a study by Case-Smith, occupational therapy interventions can improve social skills and behavior in children with ASD.

Addressing motor skills: Children with ASD may have difficulties with fine and gross motor skills, which can affect their ability to participate in activities and play. OTs can work with children to develop these skills through play-based interventions and exercises. According to a

review by Koenig and Rudney (2010), occupational therapy interventions can improve motor skills and participation in activities for children with ASD.

These are just a few examples of the roles that occupational therapists can play in the treatment and intervention perspectives of ASD. It's important to note that individualized interventions and interdisciplinary collaboration are key to improving outcomes for children with ASD.

2.10.5. Life skills classes

Life skills classes can be an important component of the treatment and intervention perspectives of ASD. Here are a few examples of the roles they can play, with the aid of authors:

Developing independent living skills: Life skills classes can help children with ASD develop skills related to independent living, such as cooking, cleaning, and managing money. According to a study by Dern (2019), life skills classes can improve independent living skills and employment outcomes for young adults with ASD. Improving social skills: Life skills classes can provide opportunities for children with ASD to interact with peers and develop social skills. They may also work on skills related to communication, problem-solving, and decision-making. According to a study by Herrema (2018), life skills classes can improve social skills and self-determination in adolescents with ASD. Addressing mental health concerns: Life skills classes can provide a supportive environment for children with ASD to address mental health concerns, such as anxiety and depression. They may also provide coping skills and stress management strategies. According to a study by White (2019), life skills classes can improve mental health outcomes for children with ASD. Promoting community integration: Life skills classes can help children with ASD integrate into their communities and develop social networks. They may provide opportunities for volunteering, community service, and leisure activities. According to a study by Schall, life skills classes can improve community integration and quality of life for adults with ASD.

These are just a few examples of the roles that life skills classes can play in the treatment and intervention perspectives of ASD. It's important to note that individualized interventions and interdisciplinary collaboration are key to improving outcomes for children with ASD.

2.10.6. Educational opportunities

Educational opportunities can play an important role in the treatment and intervention perspectives of ASD. Here are a few examples of the roles they can play, with the aid of authors:

Providing individualized instruction: Children with ASD may have individualized educational needs that require tailored instruction. Educational opportunities, such as Individualized Education Programs (IEPs) or specialized schools, can provide this individualized instruction. According to a study by Magiati, specialized schools can improve academic and social outcomes for children with ASD.

Improving socialization: educational opportunities can provide opportunities for children with ASD to interact with peers and develop social skills. They may also provide social skills training or social groups. According to a study by Bauminger-Zviely (2013), social skills training can improve social skills and behavior in children with ASD.

Addressing behavioral challenges: Children with ASD may have behavioral challenges that impact their ability to learn and participate in school. Educational opportunities can provide behavioral interventions, such as positive behavior support, to address these challenges. According to a study by Horner (2014), positive behavior support can improve behavior and academic outcomes in children with ASD.

Preparing for future employment: Educational opportunities can provide vocational training and preparation for future employment for individuals with ASD. They may provide job training, internships, or other work-based learning opportunities. According to a study by Taylor (2015), vocational training can improve employment outcomes for young adults with ASD.

These are just a few examples of the roles that educational opportunities can play in the treatment and intervention perspectives of ASD. It's important to note that individualized interventions and interdisciplinary collaboration are key to improving outcomes for children with ASD.

2.11.1. The role of artistic learning in the development of socialization of children with autism spectrum disorder

Artistic learning can play a significant role in communication stimulation techniques practiced in Cameroon for children with Autism Spectrum Disorder (ASD). Artistic learning encompasses various forms of creative expression, including music, dance, drama, and visual arts. These activities provide a nonverbal means of communication that can help children with ASD to express themselves and interact with others.

In Cameroon, communication stimulation techniques aim to improve socialization in children with ASD. These techniques include the use of visual aids, social stories, and role-playing activities. Incorporating artistic learning into these techniques can enhance their efficacy by providing a fun and engaging way for children to practice their communication and social skills. For example, music therapy has been shown to be effective in improving communication and social skills in children with ASD. Through music, children can learn to communicate through rhythm, melody, and lyrics. Similarly, drama and role-playing activities can help children to practice social situations and develop their social skills in a safe and supportive environment. Artistic learning can be a valuable tool in communication stimulation techniques practiced in Cameroon for children with ASD. By incorporating creative expression into these techniques, children can learn to communicate and socialize more effectively, leading to improved outcomes and a better quality of life.

2.11.2. Enhance confidence/self-esteem

Artistic skills can enhance self-confidence and self-esteem in children with ASD in several ways: Providing a nonverbal means of expression: Children with ASD may struggle with verbal communication, but art can provide a nonverbal means of expression. Creating art can help children with ASD communicate their thoughts, feelings, and experiences in a way that is comfortable and familiar to them. Fostering a sense of accomplishment: Artistic skills can provide children with ASD with a sense of accomplishment and pride in their abilities. Creating art can be a tangible and visible way for children with ASD to see their progress and growth over time. Encouraging self-expression: Artistic skills can encourage children with ASD to express themselves in new and creative ways. This can help them develop a sense of identity and self-

awareness, which can lead to increased self-confidence and self-esteem. Providing a positive outlet for emotions: Creating art can be a therapeutic and calming activity for children with ASD. It can provide a positive outlet for emotions and stress, which can help improve their overall emotional well-being.

According to a study by Kaimal, art therapy interventions can improve social skills, self-esteem, and overall quality of life in children with ASD. Another study by Van Lith (2015) found that participation in a visual arts program improved self-esteem and self-efficacy in adolescents with ASD. Artistic skills can be a valuable tool for enhancing self-confidence and self-esteem in children with ASD. Artistic activities can provide a safe and supportive environment for children with ASD to explore their creativity and express themselves, which can lead to improved emotional well-being and greater self-awareness.

2.12.1. Implementation of inclusion

Artistic learning can play a significant role in the implementation of inclusion communication stimulation techniques practiced in Cameroon for children with ASD. Inclusion communication stimulation techniques aim to create an inclusive environment where children with ASD can learn and socialize alongside their peers without disabilities.

Artistic learning activities such as music, dance, drama, and visual arts can provide a fun and engaging way for children with ASD to interact with their peers. Through these activities, children can learn to express themselves, build confidence, and develop their social skills. In addition, artistic learning can help to break down barriers between children with and without disabilities. By participating in artistic learning activities together, children can develop empathy and understanding for one another, leading to more inclusive and accepting social environments.

The efficacy of inclusion communication stimulation techniques can be improved through the incorporation of artistic learning. By providing a creative outlet for children with ASD, these techniques can become more engaging and effective in improving socialization skills. Artistic learning can play a vital role in the implementation of inclusion communication stimulation techniques in Cameroon. By providing a fun and engaging way for children with ASD to develop their social skills, artistic learning can help to create more inclusive and accepting communities.

Artistic learning can play an important role in the implementation of inclusion communication stimulation techniques for children with Autism Spectrum Disorder (ASD) in Cameroon. According to several authors, artistic activities such as music, dance, and drama can improve socialization in children with ASD by promoting engagement, self-expression, and emotional regulation. For example, a study by Wigram (2010) found that music therapy can improve social communication and interaction in children with ASD. The study showed that music therapy sessions increased eye contact and social responsiveness in the children, as well as improving their emotional regulation.

Similarly, a study by La Gasse (2014) found that drama therapy can improve social communication and interaction in children with ASD. The study showed that drama therapy sessions increased nonverbal communication and social skills in the children, as well as improving their emotional regulation. In the context of Cameroon, these findings suggest that artistic learning can be a valuable tool for implementing communication stimulation techniques and improving socialization in children with ASD. For example, music and drama therapy sessions can be incorporated into social skills training programs for children with ASD, providing them with opportunities to engage in artistic activities that promote social interaction and emotional regulation.

Additionally, artistic activities can provide a platform for children with ASD to express themselves creatively and develop a sense of accomplishment, which can improve their self-esteem and self-confidence. This can be particularly important in the context of inclusion, where children with ASD may face social challenges and stigma. The role of artistic learning in implementing inclusion communication stimulation techniques for children with ASD in Cameroon is significant. By incorporating artistic activities such as music, dance, and drama into social skills training programs, children with ASD can improve their socialization skills and develop a sense of accomplishment and self-confidence.

2.12.2. Foster communication development

Artistic learning can play a significant role in fostering communication development in children with autism spectrum disorder (ASD). Artistic activities such as music, dance, drama, and visual arts can help children with ASD to express themselves creatively and develop their communication skills. Studies have shown that artistic learning can improve socialization in

children with ASD. For example, music therapy has been found to be effective in improving social interaction and communication skills in children with ASD. Similarly, drama therapy has been found to improve social skills such as eye contact, turn-taking, and emotional expression.

In Cameroon, there are various communication stimulation techniques practiced to improve socialization in children with ASD. These techniques include speech therapy, occupational therapy, behavioral therapy, and play-based interventions. These interventions aim to improve communication skills such as language development, nonverbal communication, and social interaction. The efficacy of these techniques depends on various factors such as the severity of the child's condition and the individualized approach used by the therapist. However, studies have shown that early intervention and a multidisciplinary approach that includes artistic learning can significantly improve communication development and socialization in children with ASD.

It is important to note that, artistic learning can play a crucial role in fostering communication development and improving socialization in children with ASD. Communication stimulation techniques practiced in Cameroon can also be effective when used as part of a multidisciplinary approach that includes artistic learning.

2.13. The effects of dancing, singing, drawing and their efficacy improving socialization in Children with Autism Spectrum Disorder

2.13.1. Dancing

Dancing has been shown to have a positive impact on socialization in children with ASD. In a study conducted by Karkhaneh (2012), children with ASD who participated in a dance program showed significant improvements in social interaction skills, including increased eye contact, initiation of social contact, and response to social cues. Similarly, a study by Srinivasan and Bhat (2013) found that children with ASD who participated in a dance intervention showed improvements in social communication skills, such as turn-taking and joint attention. Authors such as Srinivasan and Bhat (2013) suggest that dancing may be effective in improving socialization skills in children with ASD because it involves physical movement, sensory stimulation, and social interaction. Dancing allows children to express themselves creatively while also engaging with others in a structured and predictable environment.

The efficacy of dancing in improving socialization skills in children with ASD has been supported by research and can be a valuable tool in the implementation of inclusion communication stimulation techniques. By incorporating dance into these techniques, children with ASD can have fun while also developing important social skills.

2.13.2. Singing

Dancing can have several positive effects on children with Autism Spectrum Disorder (ASD), including improving socialization skills. Some of the potential benefits of dancing for children with ASD are: Improved communication skills: Dancing can help children with ASD to communicate better by using nonverbal cues such as body language, facial expressions, and gestures. Increased social interaction: Dancing in a group setting can help children with ASD to interact with their peers and develop social skills such as taking turns, sharing, and cooperating. Enhanced motor skills: Dancing involves physical movement that can improve coordination, balance, and gross motor skills in children with ASD. Reduced anxiety: Dancing can be a fun and enjoyable activity that helps reduce anxiety and stress in children with ASD. Improved self-esteem: Participating in dance classes can boost self-confidence and self-esteem in children with ASD by giving them a sense of accomplishment and belonging. Dancing can be an effective tool for improving socialization in children with ASD by providing opportunities for communication, interaction, and physical activity in a supportive environment.

2.13.3. Drawing

Drawing can have several positive effects on children with Autism Spectrum Disorder (ASD) and can improve their socialization skills. Some of the effects of drawing in children with ASD are: Enhances communication skills: Drawing helps children with ASD to express themselves better and communicate their thoughts and feelings through visual art. This can help them to communicate more effectively with others.

Improves fine motor skills: Drawing involves using fine motor skills, which can help children with ASD to improve their hand-eye coordination, dexterity, and control over their movements.

Reduces anxiety: Drawing can be a calming activity for children with ASD, which can help to reduce anxiety and stress levels.

Increases attention span: Drawing requires focus and concentration, which can help children with ASD to improve their attention span and ability to concentrate on tasks.

Encourages creativity: Drawing encourages creativity and imagination in children with ASD, which can help them to think outside the box and come up with new ideas. Promotes socialization: Drawing is a social activity that can be done in groups or pairs, which can help children with ASD to interact with others and develop social skills such as sharing, taking turns, and collaborating.

Drawing is an effective tool for improving socialization in children with ASD as it helps them to communicate better, reduces anxiety levels, improves fine motor skills, increases attention span, encourages creativity, and promotes socialization.

2.41.1. Self-confidence

Self-confidence is generally defined as a belief in one's own abilities, qualities, and judgment. It is the assurance and trust in oneself to handle challenges, make decisions, and achieve goals. Various authors and international bodies have provided their definitions of self-confidence: According to the renowned psychologist Nathaniel Branden, self-confidence is "the experience of being competent to cope with the basic challenges of life and being worthy of happiness." Also, the American Psychological Association (APA) defines self-confidence as "a belief in one's own capabilities to successfully meet life's challenges and demands. "Again, the World Health Organization (WHO) describes self-confidence as "a state of mind characterized by a sense of trust in one's abilities, qualities, and judgments."

Self-confidence is a crucial aspect of one's personality that influences their behavior, decision-making, and overall well-being. According to authors and international bodies, self-confidence plays a significant role in personal and professional success. Here are some perspectives on self-confidence:

Psychological Perspective: From a psychological perspective, self-confidence is viewed as an essential component of mental health and well-being. According to the American Psychological Association (APA), "self-confidence is a key factor in reducing anxiety, stress, and depression." It helps individuals cope with challenges and setbacks, and enables them to take risks and pursue

their goals. For example, a person with high self-confidence is more likely to speak up in a meeting or take on a new project at work.

Social Perspective: From a social perspective, self-confidence is viewed as a critical factor in building relationships and social connections. According to a study by the University of California, "people who are self-confident are more likely to be perceived as attractive, likable, and trustworthy." This can lead to more opportunities for social interaction and networking, which can be beneficial in both personal and professional settings. For example, a person with high self-confidence may be more likely to approach someone they find interesting at a social event.

Educational Perspective: From an educational perspective, self-confidence is viewed as an important factor in academic achievement. According to the National Association of School Psychologists (NASP), "students who have high self-confidence are more likely to set challenging goals for themselves and persist in the face of obstacles." This can lead to better grades, higher levels of engagement in the classroom, and increased motivation to learn. For example, a student with high self-confidence may be more likely to participate in class discussions or ask questions when they don't understand something.

It is important to note that self-confidence is a critical aspect of personal and professional success. It influences our behavior, decision-making, and overall well-being. By understanding the psychological, social, and educational perspectives of self-confidence, we can work towards building and strengthening our own self-confidence and most especial with people living with autism, leading to a more fulfilling and successful life.

2.41.2. The psychologist view of self-confidence/self-esteem

Psychologists have different perspectives on adaptation, but in general, adaptation refers to the ability of individuals to adjust and cope with changes in their environment or circumstances. To Jean Piaget we are born already with an existing knowledge but the fact that the knowledge is not in an order gives a problem. So, to Piaget the child is to adapt in any new environment if he passes through the process of adaptation and assimilation.

Some psychologists view adaptation as a process of learning and change. For example, Jean Piaget's theory of cognitive development describes how children adapt to their environment

through a process of assimilation and accommodation. According to Piaget, children initially assimilate new information into their existing schemas (mental frameworks), but they may need to accommodate their schemas to fit new information. This process of assimilation and accommodation allows individuals to adapt to new situations and experiences.

Other psychologists view adaptation as a response to stress or adversity. Richard Lazarus's theory of stress and coping, for example, emphasizes the role of cognitive appraisal in shaping emotional and physiological responses to stress. According to Lazarus, individuals who appraise a situation as a threat are more likely to experience negative emotions and physiological responses, while those who appraise a situation as a challenge are more likely to experience positive emotions and physiological responses.

The view of adaptation according to Eric Ericson the process of adaptation refers to the process by which individuals adapt to the challenges and conflict of each stages of development this is so because he tries to bring the stages of development on how it leads to adaptation. According to Eric Ericson very a successful adaptation requires a balance between the individual in order to adapt to the environment and so

CHAPTER 3: THE THEORETICAL BACKGROUND OF THE WORK

3.1.1. The social motivation theory

The theory of social motivation in autism was first proposed by a group of researchers led by Dr. Tony Charman in the early 2000s. The theory suggests that individuals with autism have a reduced motivation to engage in social interaction, which contributes to their social communication challenges.

According to the theory, individuals with autism may have a reduced sensitivity to social rewards, such as social approval or praise, which makes social interaction less motivating for them. This, in turn, can lead to reduced social engagement, which can further exacerbate social communication difficulties.

The theory of social motivation in autism has since been supported by a growing body of research, and has led to the development of interventions aimed at increasing social motivation in individuals with autism. These interventions often involve the use of social rewards, such as praise or tokens, to increase the motivation to engage in social interaction, and have shown promising results in improving social communication skills in individuals with autism.

The Social Motivation Theory proposes that a lack of social motivation is the primary deficit in autism. This theory suggests that autistic individuals do not find social stimuli to be inherently rewarding, which leads to a reduced motivation to engage in social interactions. As a result, they may struggle to develop typical social skills and to adapt to social situations. Given this so because there is a push and a pull that dictate certain behaviors that people inhibit and activities that they perform in society. Here the motivation here varies according to the stimuli which are around the autistic child. Human being having certain Research has shown that autistic individuals often display reduced interest in social stimuli, such as faces and social cues. Additionally, studies have found that interventions that focus on increasing social motivation, such as reinforcing social interactions with rewards, can be effective in improving social skills in autistic individuals.

However, while the Social Motivation Theory provides a useful framework for understanding social deficits in autism, it is important to consider other factors that may contribute to social difficulties in autistic individuals. For example, some research suggests that deficits in social

cognition, such as difficulty understanding the mental states of others, may also contribute to social difficulties in autism. Additionally, sensory processing differences and other co-occurring conditions can also impact social functioning in autistic individuals.

Some key points regarding this theory and its relation to self-confidence development in autistic children.

Understanding Social Motivation

Social Engagement Social motivation refers to the intrinsic drive to connect with others. For autistic children, this drive can manifest differently, often influenced by sensory sensitivities, communication challenges, and social understanding.Variability: Autistic children may have varying levels of social motivation. Some may actively seek social interactions, while others may prefer solitude or have difficulty initiating interactions.

Impact on Self-Confidence

Social Skills Development: Engaging in social interactions helps children develop critical social skills. Mastering these skills can lead to increased self-confidence as they become more adept at navigating social situations.

Positive Reinforcement: Successful social experiences can provide positive reinforcement, boosting self-esteem. Conversely, negative experiences can diminish confidence, making it essential to create supportive environments.

Role of Supportive Relationships

Safe Spaces: Establishing safe and supportive relationships (with family, peers, and educators) can foster a sense of belonging and acceptance, which is crucial for self-confidence. Modeling Behavior: Adults and peers can model social behaviors, providing autistic children with examples to emulate, which can enhance their confidence in social settings.

Individualized Approaches

Tailored Interventions: Recognizing that each autistic child is unique, interventions should be tailored to their specific needs, interests, and levels of social motivation. This may include social skills training, play therapy, or structured group activities. Encouragement of Interests**: Focusing on the child's interests can facilitate meaningful social interactions, making them more motivated to engage with peers.

Building Resilience

Navigating Challenges: Teaching coping strategies for handling social challenges can help autistic children build resilience. This resilience is vital for maintaining self-confidence in the

face of social difficulties. Celebrating Progress: Acknowledging and celebrating small achievements in social interactions can reinforce a child's belief in their abilities.

Cultural and Contextual Factors

Cultural Variations: Social motivation can be influenced by cultural norms and values, which may affect how autistic children experience and engage in social interactions. Contextual Support: The environment such as schools and community settings—plays a crucial role in shaping the social experiences of autistic children. Social motivation is a critical factor in the development of self-confidence in autistic children. By fostering supportive environments, promoting positive social interactions, and tailoring interventions to individual needs, caregivers and educators can significantly enhance the self-esteem and social skills of autistic children, leading to greater overall well-being.

Some examples of tailored interventions for autistic children with low social motivation:

Social Skills Training; tructured Programs**: Use structured programs that focus on specific social skills, such as initiating conversations, understanding nonverbal cues, and taking turns in play. Role-playing can be particularly effective. Small Group Settings**: Conduct training in small, supportive groups to reduce anxiety and encourage participation.

Interest-Based Activities

Focused Playgroups: Create playgroups based on shared interests (e.g., gaming, art, or nature) to facilitate natural interactions and engagement. Clubs or Workshops**: Establish clubs or workshops that revolve around the child's interests, allowing them to connect with peers in a meaningful way.

Social Stories and Visual Supports: Social Stories: Develop personalized social stories that illustrate social situations and appropriate responses. This can help children understand social dynamics in a relatable context. Visual Aids: Use visual supports, like charts or diagrams, to explain social concepts and routines, making them more accessible. Peer Mentoring Programs

Buddy Systems: Implement buddy systems where a more socially confident peer can provide support, guidance, and encouragement in social situations.

 Mentorship: Pair autistic children with mentors who share similar interests, fostering a sense of connection and motivation to engage socially.

Therapeutic Approaches

Play Therapy: Use play therapy to create a safe space for children to express themselves and explore social interactions at their own pace. Cognitive Behavioral Therapy (CBT): Incorporate CBT techniques to help children understand and manage their feelings about social interactions, building confidence over time.

Parent and Caregiver Training

Workshops: Offer workshops for parents and caregivers on how to encourage social motivation at home, including strategies for facilitating playdates and social interactions.

Modeling Behavior: Teach caregivers to model positive social interactions, demonstrating effective communication and social skills.

Technology-Assisted Interventions

Social Apps and Games: Utilize apps and games designed to enhance social skills in a fun, engaging way, allowing children to practice in low-pressure environments.

Virtual Reality (VR): Implement VR programs that simulate social situations, providing a safe space for practice without real-world consequences.

Gradual Exposure

Increasing Complexity: Start with low-stakes social interactions (e.g., brief conversations with familiar peers) and gradually increase the complexity as the child becomes more comfortable. Routine Incorporation: Integrate social opportunities into daily routines, such as group activities during breaks at school.

Tailored interventions for autistic children with low social motivation should focus on building connections through shared interests, providing supportive environments, and gradually increasing social engagement. By creating positive and meaningful social experiences, these interventions can help boost social motivation and overall self-confidence.

3.2.1. The theory of Self-regulation

Self-regulation refers to the ability of an organism to maintain a stable internal environment despite changes in the external environment. In the context of autism, self-regulation can refer to the ability of individuals with autism to regulate their own emotions, behavior, and sensory experiences. This theory is made to discover the internal needs of the children and by so students learn by setting goals for the present and future through cognitive, behavioral and motivational way in this self-regulation we assess it in three major strategies which are; self- determination, self-assessment and self-support and these three strategies are made through observation (Garyfalia Charitaki 2019). More so, it is the self-regulation that contribute to the development of ASD in the school setting and the society in general

This theory which is developed by Albert Bandura in the year 1991 some behaviors like choice task done are influenced by self-regulation but Some researchers and clinicians have suggested

that difficulties with self-regulation may underlie many of the symptoms of autism, such as repetitive behaviors, sensory sensitivities, and social communication challenges (Garyfalia Charitaki 2019). Therefore, interventions aimed at improving auto-regulation may be beneficial for individuals with autism.

It is important to note that the social motivation refers to the internal drive or desire to engage in social interactions and connect with others. In individuals with ASD, social motivation is often diminished compared to their neurotypical peers. This reduced social motivation can stem from various factors, including difficulties in understanding and interpreting social cues, challenges in perspective-taking and empathy, and differences in brain function related to social processing. Also, when children with ASD struggle in social situations, it can have a negative impact on their self-confidence. Repeated experiences of social rejection, misinterpretation of social cues, or difficulties forming and maintaining relationships can lead to feelings of frustration, isolation, and low self-esteem. Enhancing social motivation helps address these challenges and promotes self-confidence. More so, social skills training plays a crucial role in developing self-confidence in children with ASD. It involves teaching specific social skills, such as initiating conversations, taking turns, sharing, and understanding non-verbal cues. Individualized training programs tailor interventions to the child's unique needs, strengths, and interests. By providing targeted support and practice, children can improve their social interactions, which in turn boosts their self-confidence. Again, creating opportunities for positive social experiences is essential for building self-confidence. Structured activities, such as social skills groups or cooperative games, provide a safe and supportive environment for children with ASD to practice their newly acquired social skills. These activities allow them to interact with peers who may share similar challenges, fostering a sense of belonging and acceptance. Visual supports, such as social stories, can be effective tools in helping children with ASD understand and navigate social situations. Social stories are personalized narratives that provide step-by-step explanations of social expectations, potential challenges, and appropriate responses. These visual supports help children with ASD anticipate and prepare for social interactions, reducing anxiety and increasing self-confidence. Positive Reinforcement and Feedback: Providing specific and constructive feedback, along with positive reinforcement, is instrumental in developing self-confidence. Recognizing and praising children's efforts, progress, and achievements in social interactions can significantly boost their self-esteem. It is important to focus on small successes and incremental improvements,

highlighting the child's strengths and growth. Collaborating with Parents and Educators: Developing self-confidence in children with ASD requires a collaborative effort between parents, educators, and therapists. Consistent communication and coordination among these stakeholders ensure that strategies are integrated across various settings, such as home, school, and community. This holistic approach maximizes the child's exposure to positive social experiences and reinforces their self-confidence.

By applying the principles of social motivation theory and implementing strategies that address diminished social motivation, children with ASD can develop self-confidence and improve their social skills. It is essential to recognize that each child is unique, and interventions should be tailored to their specific needs, strengths, and interests. With time, practice, and support, children with ASD can build fulfilling social connections and thrive in their interactions with others.

some examples that illustrate how social motivation theory can help develop self-confidence in children with Autism Spectrum Disorder (ASD):

Individualized Social Skills Training: Let's say a child with ASD struggles with initiating conversations. An individualized social skills training program can be designed to target this specific area. The child may be taught strategies such as starting with small talk topics or using conversation starters like asking about someone's interests. With practice and guidance from a therapist, the child gradually gains confidence in initiating conversations, leading to improved self-confidence in social interactions.

Social Learning Opportunities: Imagine a child with ASD who finds it challenging to participate in group activities. A social skills group can be organized, consisting of children with similar social difficulties. They engage in activities that encourage cooperation, turn-taking, and communication. Through these structured experiences, the child with ASD gets opportunities to practice social skills in a supportive setting, fostering a sense of competence and self-assurance.

Visual Supports and Social Stories: Let's consider a child with ASD who struggles with understanding and following social rules during playtime. A visual support, such as a visual schedule or social story, can be created to depict the expected behaviors and rules. For instance, the social story might explain waiting for a turn, sharing toys, and using polite language. By

using these visual supports, the child gains a better understanding of social expectations, reducing anxiety and promoting self-confidence in social situations.

Positive Reinforcement and Feedback: Suppose a child with ASD is working on making eye contact during conversations. The parent or teacher can provide positive reinforcement and feedback when the child makes progress. For example, they may say, "Great job maintaining eye contact during our conversation! It shows that you are really listening and engaged." This type of positive reinforcement and specific feedback encourages the child, boosts their self-esteem, and motivates them to continue practicing and improving their social skills.

Collaborating with Parents and Educators: Collaboration between parents, educators, and therapists is crucial in supporting a child's social development. For instance, parents can communicate with the child's teacher about the specific social goals they are working on at home. The teacher can then incorporate similar strategies and interventions in the classroom setting, creating consistency and reinforcing the child's progress. This collaborative effort ensures that the child receives support and reinforcement across different environments, leading to enhanced self-confidence in social interactions.

These are just a few examples, and interventions should be tailored to the unique needs of each child with ASD. With consistent practice, targeted interventions, and a supportive environment, children with ASD can develop self-confidence and navigate social interactions more effectively.

PART TWO: METHODOLOGICAL AND EMPIRICAL FRAMEWORK OF THE STUDY

CHAPTER 3: RESEARCH METHODOLOGY

4.1.1. Recall of the general research question

Does the implementation of the Picture Exchange Communication System (PECS) contribute to the development self-confidence in children with autism?

4.1.2. The specific research question

SRQ1: Does the use artistic skills contribute the development of self-confidence in children with autism?

SRQ2: Does the use of reinforcement contribute to the development of self-confidence in children with autism?

SRQ: Does the use of social interaction contribute to the self-confidence development in children with autism?

4.3.1. General objectives of research

To understand the effectiveness of the PECS approach and individualized adaptations in promoting communication development and self-confidence in children with autism.

4.3.2. The specific objectives

SO1: To understand how the use artistic skills contribute the development of self-confidence in children with autism.

SO2: To understand how the use of reinforcement contribute to the development of self-confidence in children with autism.

SO3: To understand how the use social interaction contribute to the self-confidence development in children with autism.

According to Anapama Ayanand (2018) the research process begins and ends with a research hypothesis because it is the core of the procedure of research and so as a consequence gives a relationship between the variables in the research process. So, given our point of focus which is our research, we bring out the general hypotheses as the implementation of the Picture Exchange Communication System (PECS) can impact the development self-confidence of children with autism.

It is constituted of two variables which are the independent variables (IV) and the dependent variable (DV)

According to De Landshere (1969) the independent variable is the variable which relates the cause and the effect. Also called the experimentary variable, the stimulus variable or the active variable, it can be easily manipulated by the researcher so as to explain the observed phenomenon which has been observed.

In our research we have an independent variable which will act as a stimulus to our research. This variable will be easily used by the researcher to bring out the modalities which are the following: artistic skills, reinforcement, and social interaction. In these modalities are going to be brought from its indicators as seen below.

Given that our independent variable of studies is PECS approach. It has all together four modalities which are;

4.4.1. Presentation of the center

The Einstein Center is a psychopedagogical center that takes care of and accompanies children with special and normal needs (minority). It implements educational actions to enable learning in children with learning disabilities.

Created in 2001, the Einstein Center was initially a consultation office for children with specific needs. After 7 years of operation, the cabinet once will be transformed into a psychopedagogical center in 2007; questioned the number of its learners, which continued to grow. The center is now an establishment under the supervision of the Ministries of Basic Education and Social Affairs.

The Einstein Center is located in the economic capital of Cameroon; central region; department of Mfoundi, district of Yaoundé 6; Nkolbikok district behind transformer (uphill MATGENIE national park)

The founder of the center is Mrs. KATIHABWA, born NJONKOU MARIANNE GISELE. She is a special education teacher and family therapist. The center is under the direction of Mrs. Payou Zenabou Zita, a teacher with a lot of experience in the educational care of children suffering from TND.

The teaching team is made up of:

  - From a psychologist

  - From a pediatrician

  - A speech therapist

  - From a psychomotrician

  - Two specialized educators

  - Social workers

  - Teachers and teachers

4.5.1. Definition of the study population

The population of studies refers to the set of elements having one or more characteristics such as which distinguish them from other elements and on which the litigation arises (Anger, 1992-238), it means the set of individuals having in them the same characteristics on which us as researchers we can conduct our studies. From this population of studies researchers will bring out their result from what they got from the research that was conducted. Generally, it is seen as a group of individuals who have the same characteristics as concerning our research. Taking into account all the explanation above we are interested on children with Autism are enrolled in an inclusive educative and psycho-pedagogic center region precisely in Yaounde these which made us to study these children who express the same characteristics so given our main objective here which is to study the quality of adaptation in these children with autism in an inclusive educational institute or center.

4.5.2. The target population

The target population according to (Louise Barnbee & Son Ngiem, 2018) the target is a group of individuals which researchers conduct on these individuals and draw conclusions from. The characteristic of choosing this targeted population is based on the literature and the practices, the objectives of the study and the contextual information of the studies.

This target population is the one which the researcher is going to or will generalize his result our result from. In the part of our studies, we are going to study children with autism in a psycho-pedagogic institute of a quarter in mellen presicely monte du parque in the centre region (Yaounde)

This is so because given the vast nature of this population which we will have to concentrate in a particular sector which will help us in the generalization of the result.

4.5.3. Definition of sample

The sample here always represents a method which is the one of the characteristically representation of the population of research or the target population. So, in the context of our research, the representativeness is not really important since our research is qualitative and does not necessarily need a representative nature. This is so because the qualitative method gives us the qualitative method gives us feeling emotions and feelings of participant and most especially

knowing the innermost behavior of the participants and makes things more of empirical and pragmatic than ideological (rahman.MS,2016)

The time this type of research takes it is on the part of the researcher to determine his participants given that everyone cannot be chosen to participate this is so because the participation depends on the purpose of the research which is made and most importantly on the researcher's discretion (musarrat shaneen, 2021). This is so because many researchers turn to face difficulties because the choice of sampling was wrongly made. That is the answers given by the participant must be reliable in order to make interpretation very simple. This will be done by the researcher providing every detail that was given to him by his participants. This is so because the result will also be affected by the way the sampling is being made and so, the selection of a right type of sampling technic will be very important.

Our research we are going to use a non-probability sampling given that we have some knowledge about our population. That is, we knowing the characteristics of the population, we are studying the peculiar thing about this method of research is the fact that all the sample have equal chance of being selected to carry out studies on them. Given that we are in a qualitative and using a non-probability type of research, that is why in our research we are going to be using the reasoning sampling method which in this method here the sampling will be restrain we shall be carrying our research on (03) subject or cases.

4.6. Choice of method of data analyses

It is important to note that the method we used in the presentation of data is active participation through observation and questionnaires addressed to the teachers

4.6.1. Observation as a research tool

  We choosed observation as our first tool because the children being the center of our work, we were   Observation considered to be one of the most used and important methods in social sciences and at the same time one of the most diverse. Observation here permits us not to enter directly into illusion but it gives us the facts about our research by linking the researcher directly. So, when talking about observation we distinguish two types observation.

- **The participant type of observation**

In this type of observation, the observer tries to be one with his environment and also to appropriate the population life style. This when the participant merges in the group and tries to bring out some characteristics of the population. The idea here is to reach the objectives of research without being a burden to the group whom the researcher is carrying out research on.

- **Non participant observation**

Here the observer observes without the human interaction into the field. Here is not really connected to the realities of the field. Here the researcher adjusts their roles depending on the requirement or the objectives that where set at the beginning of the research. So, no matter the type of research the observer has to be objective in his research no matter the type of research he is using subjective because the observer in his research has to set objectives which will guide him and not.

As concerning our research, we are going to do a participative observation, that is before even giving a statues of participant observation to our research we have to give the methodology which is will guide our work, which here we are seeing it as the one of giving a social experience to our work. in other words, it consists of merging with the observed still in the respect of the liberties of the participants in order not to be an agent of distraction of the participant which at the end can participate to the abnormal behavioral change of the participant of our research. Their free expression. The purpose of these interviews is to detect in the verbal discourse of the participants the modalities of the strategies used by them to deal with burn gut. Thus, the elements that reflect the resilience of the worker will be identified in their speech topics to be covered. The order is not imposed. The interviewee is invited to develop a theme which It includes an interview plan with a starting instruction and a grid is proposed to him. He must speak freely. The interviewer's mission is to let the person speak and to follow up gradually. A case study the semi-directive interview is one of the methods that allows to collect the data in qualitative research. It is a technique for collecting information that can center the discourse of the people interviewed on defined themes that are clearly recorded in an interview guide. One of its characteristics is the fact of enclosing the discourse of the interviewee in predefined questions, or in one of the interviews allows "direct contact between the researcher and the interlocutors, emphasizes Quivy and Campenhoudt (2006, p .174). In general, the semi-dif interview makes it possible to collect information such as facts and verifications of facts,

opinions and points of view, analyses, proposals, reactions to the evaluators' hypotheses and conclusions. It therefore seemed more appropriate to us to choose this tool for the following reasons: it is a tool which allows the researcher to create subjective data in complete freedom, the interlocutor to qualify his remarks and allows us to have a maximum of objectivity. Our interview guide, found in years, contains questions developed and grouped by research hypotheses. We have listed the theoretical elements in connection with the questions in order to facilitate the work of analysis and to always have the theoretical elements in mind. This tool was a real support for us during our interviews and contributed to their smooth running. For the interviews, we followed this guide

Our interviews took place at the institute psychopedagogique Einstine. They were conducted by ourselves. We have agreed with these employers on the time and the day in order to allow them to be focused on the theme without being preoccupied with another obligation.

They were made for two days in quiet places so as not to be interrupted. Some interviews were carried out in different offices, others in meeting rooms and still others in the company's infirmary. During the interview we evoked the theme then the sub-theme on which the subject had to express himself. And as his speech evolved, we made use of reminders to orient his remarks, according to our research objectives, and to lead him to provide us with more exhaustive explanations or information. We listened to the helper without interrupting her, being attentive to her story by taking notes from time to time. During the listening, we avoided replacing ourselves with the caregiver by keeping our empathetic neutrality and our calm, in order to have a better appreciation of the situation.

The duration of our interviews varied between fifteen and twenty-five minutes. Overall, we had a relaxed atmosphere and the interviewees seemed at ease in the interview. Once the content of the interview guide was covered in its entirety, we proceeded to the closing procedures. To close the interview, we thank the caregiver for her availability and her collaborative effort. Then we asked her if she has anything else to add; this detail was taken into account in writing or by recording.

4.7.1. Analyses and technic of result

After the different articulation which constituted an instrument of data collection which as a consequence of using this type of data collection instrument, we had to choose the qualitative analyses of our result. Which made us not focus on the calculation but to orientate ourselves towards psychological analyses of our result through the observation we made which through our point of focus observed some phenomenon which made our research more tangible.

4.7.2. The techniques of analyses of results

To analyze our data collected which is a qualitative one we used the content analyses. What we mean by content analyses technic consist of the method which looks on what was said during the interview what they said, trying to make it as objective as possible and very reliable this is so for Berenson (1952) it is defined it is defined as "as *a technique of research for objective description, systematic, and qualitative of the content manifested from communication"* this means our analyses we are going to base ourselves on the objective analyses of our qualitative results. The survey material collected during observations, group interviews or individual interviews: behaviors, words, gestures, what is not said and what is implied.

Bardin (1977, p.43), argues that "*content analysis is a set of communication analysis techniques*". For this author, the procedure generally includes the transformation of an oral discourse into text, then the construction of an analytical instrument to study the meaning of the remarks. In these analyses we made to take the analyses from a communicational perspective which brings us to bring out the elements which are necessary for the uses of the research. These techniques generally have a problem the incomplete analyses.

CHAPTER 5: PRESENTATION OF RESULTS AND DISCUSSION

In this chapter we are going to present the result of our studies and also the analyses of content which will depend on every case which will drive us to the syntheses of categorical analyses obtained. The origin of this chapter is from the participative observation we made and also the interview we carried out with the educators of the center.

5.1.1. The presentation of the studied cases

In this part we are going to present the cases of our studies, this presentation will be based on the various reactions to the various PECS strategies in regard to each case

Table 3: The observation grid to test the how has the implementation of the Picture Exchange Communication System (PECS) impacted the development of self-confidence in children with autism.

Artistic skills	Fair	Poor	Good	Excellent
Their reactions to songs and music				
How they react towards drawing and painting activities				
How the children relate to sport activities				

Reinforcement	Fair1	Poor2	Good3	Excellent4
Their reactions after accomplishing a certain task and been praised				
The impact of encouragement and its contribution to the educational growth of the child				
Children's reactions after accomplishing a certain task and been reworded				

Social interaction	Fair1	Poor 2	Good 3	Excellent4
Child's reaction to role play				
Evaluate the child's development emotional skills				
The children's reaction when faced with problem solving				

> ➢ **case 1:**

Case Example: Building Self-Confidence in an Autistic Child

Child's Background:

Our first case is a seven-year-old boy that was diagnosed with autism spectrum disorder (ASD) at the age of three. He displayed certain characteristics associated with low self-confidence, such as social anxiety, reluctance to engage in new activities, and difficulty expressing himself verbally. His parents decided to seek professional help to address his challenges how boost his self-confidence or self-estimate.

Intervention Plan:

His parents collaborated with a team of professionals, including a psychologist, speech therapist, and behavioral therapist, to develop an intervention plan tailored to the child needs. One of the primary goals was to enhance his self-confidence through artistic skills-based strategies.

Identifying Strengths:

The first step was to identify his strengths and interests. We observed that he had a keen interest in drawing and painting. He showed great attention to detail and exhibited exceptional artistic abilities. His team decided to leverage these strengths to build his self-confidence.

Setting Achievable Goals:

The team helped the child set achievable goals related to his artistic pursuits. Initially, the goals were small and easily attainable to ensure success and reinforce his confidence. For example, his first goal was to complete a simple coloring page or draw a basic shape.

Positive Reinforcement:

The team implemented a system of positive reinforcement to motivate and reward his efforts. Whenever he achieved a goal or made progress, he received praise, encouragement, and tangible rewards, such as stickers or small art supplies. This positive reinforcement helped Jake associate his achievements with feelings of accomplishment and boosted his self-confidence.

Gradual Exposure to Challenges:

As the confidence grew, the team gradually introduced more challenging tasks related to his artwork. They encouraged him to experiment with different techniques, use more complex colors, and eventually create his own original pieces. With each successful step, Jake received reinforcement and recognition, further enhancing his self-esteem.

Social Skills Training:

Alongside his artistic pursuits, the team also worked on improving his social skills. They facilitated small group activities with other children who shared similar interests in art. These structured sessions provided opportunities for the child to interact, share ideas, and collaborate with his peers, promoting social confidence in a supportive environment.

Family Involvement:

His parents played a crucial role in reinforcing his self-confidence. They consistently praised his efforts, displayed his artwork around the house, and encouraged him to talk about his creations. Their unconditional support and belief in his abilities helped Jake realize his potential and feel proud of his accomplishments.

Outcome:

Over time, the children at a certain point of time self-confidence visibly improved. He started expressing himself more freely, both verbally and through his artwork. His social anxiety reduced, and he actively participated in group activities. The enhanced self-confidence not only positively impacted his artistic abilities but also extended to other areas of his life, fostering a more positive self-image and overall well-being.

This case example highlights how a combination of identifying strengths, setting achievable goals, positive reinforcement, gradual exposure to challenges, social skills training, and family involvement can contribute to building self-confidence in an autistic child. Each child is unique, and interventions should be tailored to their specific needs and interests to achieve optimal results.

The environmental conditions of the subject

The subject here is sitting position is very strategic given the fact that he seats at the second to the last bench of the class we observed that this position depended on his company he had in class given that he is seating with his friend which for one reason really appreciates his company. So seated with his friend, made the teacher to maintain his seat because, he loved playing with this his particular friend who is also autistic. His friendly attraction makes our subject to develop a good social interaction with his peers.

This friendship he developed with this friend makes us to realize another thing in this attachment to the acts very much in his behavioral changes of our subject this is So because, the child is very quiet and sometimes develops the attitude of interacting with his peers. So, the comorbidities which he has developed which is the one of the developments of phobic attitude which has made the child to inhibit it when he is playing with his friends. Because he really feels included in the activities when he sees his friend doing those same activities.

Our subject always needs emotional touch in order to carry an activity which is given to him and this is mostly shown through the touches which for him emotional exchange which is done between him and any of the persons needs him to perform an activity for him and through this to bring him to learn some new skills. Like other autistic children he attracted to images with strong colors and images which are familiar to him which will bring him a strong emotional attachment. This is seen when he sees the proprietress of the center coming, he jumps in joy to go embrace her. In this way, it can be understood that the image of the proprietress is not still new in his mind so between him and any other person the reaction will be different as he needs to perform an activity for him and through this to bring him to learn some new skills. Like other autistic children he is attracted to images with strong colors and images which are familiar to him which will bring him a strong emotional attachment.

Table 3: Observation grid to test the self-confidence in children with autism

		Scores
Artistic skills	Their reactions to songs and music	**5/15**
	How they react towards drawing and painting activities	
	How the children relate to sport activities	
Reinforcement	Their reactions after accomplishing a certain task and been praised	**7/15**
	The impact of encouragement and its contribution to the educational growth of the child	
	Children's reactions after accomplishing a certain task and been reworded	
Social interaction	Child's reaction to role play	**9/15**
	Evaluate the child's development emotional skills	
	The children's reaction when faced with problem solving	

➢ **case 2:**

Case Example 1: Building Self-Confidence through artistic skills

Child's Background:
 Our second is a five-years-old girl, was diagnosed with autism spectrum disorder (ASD) at the age of three. She exhibited characteristics associated with low self-confidence, such as difficulty initiating conversations, limited eye contact, and a tendency to withdraw from social interactions. Sophie's parents sought intervention to help her develop her self-confidence through social interactions.
Intervention Plan:

Her parents, in collaboration with a team of professionals, including a psychologist and occupational therapist, devised an intervention plan focused on improving her self-confidence through social interactions.

Small Group Social Skills Sessions:

She participated in small group social skills sessions, where she interacted with peers who also had ASD. These sessions provided a structured and supportive environment to practice social skills, including initiating conversations, maintaining eye contact, and taking turns during interactions. The sessions were guided by a therapist who facilitated social games, role-playing exercises, and group discussions.

Gradual Exposure to Social Settings:

To gradually expose her to different social settings, her therapy team organized outings to places such as parks, libraries, and community events. These outings provided opportunities for the kid to practice social skills in real-life situations while being supported by her therapist and her peers. As she experienced successful interactions, her self-confidence began to grow.

Peer Modeling and Support:

The therapy team incorporated peer modeling and support into Sophie's intervention plan. They paired her with a peer who exhibited strong social skills and acted as a positive role model. Sophie observed and imitated her peer's behaviors during social interactions, gradually building her own skills and self-confidence. The peer also provided support and encouragement, fostering a sense of belonging and acceptance.

Family Involvement:

Her parents actively participated in her intervention plan. They learned strategies to support her social interactions at home, such as initiating conversations, practicing turn-taking, and providing positive feedback. Through consistent family involvement, she received reinforcement and encouragement, which further bolstered her self-confidence.

Outcome:

As she is engaged in social interaction interventions, her self-confidence improved noticeably. She developed stronger conversational skills, maintained better eye contact, and displayed increased initiative in social settings. Sophie's growing confidence in her social abilities positively impacted her overall well-being, fostering a sense of belonging, and opening doors to new friendships and opportunities for personal growth.

- **The environmental conditions of the subject**

The subject sitting position in class gives us the idea of the close monitoring which the teachers want to keep on her given the fact that he is seated on the first bench of the class given, we realize she concentrate more better and also free from provocation by her pairs

She is not so playful this so because she gives much importance to the details around her but for her pairs does not show any interest on the play activity but gives more joy when she comes in contact with the teacher which she so much appreciates the social connection which is established between the teacher and her.

As to what concern the physical adaptation of the child, she has formed a type of repeated activities with her and at times are precized. This is so because the teachers in charge understanding the subject have made some playing activities which the child has to adapt to. They have formed in order for the child to get used to them and feel free in her activities so as to discover her skills. Her particularity with her classmates is being taken differently from her reactions. Activities are structured in depending on time and the atmosphere in her part, there is a lot of patience that is given to her by the teacher in charge of initiation. This so because she is being though with the visual aids which permit her to adapt to the didactic material presented to her by the various educators. Colors which by observation makes some importance in her process of adaptation still this color gives more importance in this educative process, it is given as the faster way for her to understand, more attention to the details around her that is why the educators use the colors to have his attention which will really bring her to learn and even know how to use the didactic materials which are provided for her. But her reserved attitude is bolstered so as to open her to play activities which develop a wide range of his understanding and develop self-esteem in her.

		Scores
Artistic skills	Their reactions to songs and music	**6/15**
	How they react towards drawing and painting activities	
	How the children relate to sport activities	
Reinforcement	Their reactions after accomplishing a certain task and been praised	**7/15**
	The impact of encouragement and its contribution to the educational growth of the child	
	Children's reactions after accomplishing a certain task and been reworded	
Social interaction	Child's reaction to role play	**9/15**
	Evaluate the child's development emotional skills	
	The children's reaction when faced with problem solving	

> **Case 3:**

Case Example: Building Self-Confidence through Social interaction

Child's Background:

Our third case is an eight-years-old boy, was diagnosed with autism spectrum disorder (ASD) at the age of four. He struggled with low self-confidence, particularly in group settings. His parents sought intervention to help him develop his self-confidence through inclusive activities.

Intervention Plan:

His parents collaborated with a team of professionals, including a psychologist and a special education teacher, to design an intervention plan centered on inclusive activities that would build his self-confidence.

Inclusive Sports and Recreation:

His therapy team introduced him to inclusive sports and recreational activities. They identified activities that aligned with his interests and abilities, such as swimming, martial arts, or team-based board games. These activities were modified and adapted to accommodate his needs, ensuring he could actively participate alongside typically developing peers.

Supportive Peers and Mentors:

To bolster his self-confidence, the therapy team facilitated connections with supportive peers and mentors.

- **The environmental conditions of the subject**

		Scores
Artistic skills	Their reactions to songs and music	4/15
	How they react towards drawing and painting activities	
	How the children relate to sport activities	
Reinforcement	Their reactions after accomplishing a certain task and been praised	9/15
	The impact of encouragement and its contribution to the educational growth of the child	
	Children's reactions after accomplishing a certain task and been reworded	
Social interaction	Child's reaction to role play	7/15
	Evaluate the child's development emotional skills	
	The children's reaction when faced with problem solving	
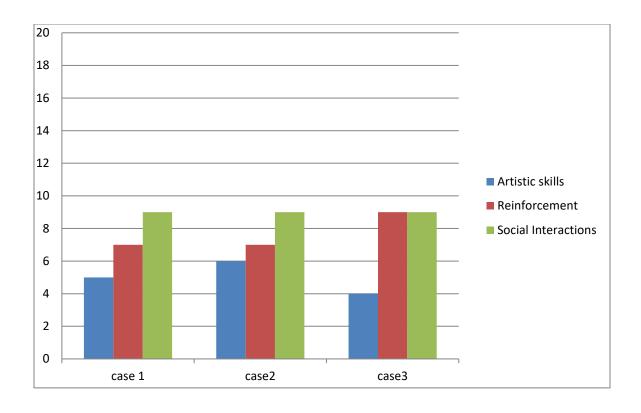
The center was very welcoming and the children also but other thing w fascinated me was the welcome was not only from the teachers but the children given their disability were able to greet

us in a welcoming manner not looking as us like strangers. This is so because the teachers had made and inculcated a habit on the children which was the one of greeting.

To continue the way of even developing even if it is considered minor a social skill on the child the subject tries to be social through the repetitive action done by the teacher in order to put in him the habit of greeting. Given the communicative barriers experienced by these children he always try to greet his teacher this is so because every morning they had the habit of greeting their teachers "bonjour" this was done in a loud and slow manner for the children to be able to pronounce audibly an well. Even some autistic children were capable of greeting in the morning even though it was not perfect but they tried their best in a way they could

What really marveled me was the way the behavioral art is being treated as regard to the his keep up in the center method was applied to these children given that they were instruments which were present for work with the children so it was easy to apply all expertise that are being thought in school and as for the expertise to be learned the center is really a well-structured for this with children with difficulties.

The chart of Adaptability

THE INTERVIEW GUIDE OF THE EDUCATORS FROM THE INSTITUT PSYCHOPEDAGOGIQUE ENSTEINE

The interview guide which we passed was for the educators of the centre psychopedagogique Einstein taken for our second tool considering that the children have links to the educators who share the same educative environment with them. We were permitted to carry out interview on the educators by the director of the center.

Theme 1: Artistic skills
- **On the part of the activity schedule**

It was said that the activities in this center are organized in respect each child's disability. Meaning that these activities are adapted to how each and every child reacts in the center "*as can see children with autism of the age limit you who are aggressive towards the other, some very silent in their own corner and you will that each child has his or her own particularities. We try to adapt the strategies to suit everyone no matter their level of disability or behavioral manifestations which bring us to the fact that they do not have the same profile*" we can therefore see the activities schedules and taken into consideration by the educators based on the

behavioral exhibition of the autistic children which for them is very different to the one of their peers

- **Contingency map**

Contingency map has to do with decision making of the children which is more of the way the educators give it to them. This is so because the children in this center are taught in of taking care of each other and so the children from there take as example from the observation they see around them during certain general activities. This bring them to an understanding of the decision making or rather contingency map. To better summarize, the educators put this attitude in them by using a type of positive technique which is the one of making the children to understand the fact of each of them is to be one another's keeper "*we put more emphases in training the children about decision making and this autonomy in their various activities which are somehow seems difficult to them because to do it we first of all have to put in the children mind that they are each other's keeper which from there the process starts. We bring a type of positive way of decision making which will always pass though love first before even going to the part of autonomy they first work on first of all taking the decisions towards others*" we see that the children here are more of concerned on concentrating their decision making on the children which will really bring them to a better understanding of themselves by themselves

- **On the symbol exchange**

In the case of symbols and how they are being used to make the children in the center feel type of secured environment given that each symbol in this environment symbolize something to the child. By the symbol we mean the emotions that are being brought from the child. From what the educator told us that each color symbolized something in the center and it is the message which is being passed by the educators to children. The educators in this sense put much value in the materialization of the environment given that it must symbolize something to the children that is why one of the interviewed participants say " *every material and object in this our center has a meaning or symbolize something that is why when you enter our school environment you are welcomed by the beautiful colors which we use as symbols of attraction and make their homes different from the school setting this is why some parents are shocked at home that their child id able to recognize some colors at home. More importantly we always try to make these colors to*

be the strong ones because this is our task of even communicating some object to them and in turn they can bring it to us"

- **On the dancing activities**

Through dancing activities which is essential for children to develop their immune system and behavior in regards to their pairs. Note that this activity contribute more on the social, physical and behavioral part on the child. "*like I said on sport the children here will at the same time during the dancing activities work on their psychomotor skills and lack from what sport gives them. "the dance we use here as one of our inclusion and self-esteem strategy is a continuation of what we do during sport but the difference is we have more of the emotions which contribute also to the additional abilities we are developing in this children."* Dancing is done with the close follow up of the educators which is very much loved by the children and is of very much important for the physical environmental adaptation of this children with autism.

- **Theme 2: On reinforcement**

On this point of the reinforcement, what we mean are praises, rewords and encouragement on the ways this can help bolster ASD children self-confidence and development of the social life of the child. In this process, most of the times, the autistic children do not communicate but rather can accomplish some common tasks and been praised to encourage them do more. The tasks may be social stories like drawings which will better help the child to recognition of the stories which is being transmitted by the educator. *"As to what concern reinforcement with these children, we use both positive and negative. Most autistic children with hyperactive, we use negative reinforcement to calm them down and help them follow up with lessons and as they active a certain task, we accompany them praises and rewords to encourage them feel free and do more. By so doing we also discover that they bit by bit gain confidence in themselves and even accomplish tasks only through observations"*. The orderly manner with which things are done in this center permit the learners to pick up fast as their parents are always   call upon to help and accompany their kids with much patience and love

Sensory breaks

- **On the children reaction during sport activities**

It is important to recall that some of these autistic children have psychomotor problems which really gives them some issues in adapting to the supposed environment. The children are organized sport activities which really increase their psychomotor skills. Sport activities bring them to adapt to their environment both social and physical *"as the tutor in charge of sport activities in this center, I would let you know that sport is life and that is why it is organize every Friday with focus on the psychomotor development of the children. The autistic as you can see, we have some children here who cannot grab things firmly but we believe they have a problem with their muscles that is why during sports we try to really develop this aspect. Also, during this activity we try as much as to accompany it with some sounds which you will realize that they develop their communicative abilities of the subject".* Therefore, during this sport activities, the teachers accompany them with sounds (music) which really make the autistic children to develop some communicative activities.

Theme 3: Social interaction

- **The reaction of the children during the playing in regards to their personal abilities**

In the center there is always a time for them to play which makes them to know each other. During this playing moment, the children develop some habits which will really bring them to understand their peers and a the same time it permit them to know each other given that they are in the same playground which at the same time will foster some development in them in them of their on social interactions " *it is something normal and gives us the opportunity in the social interaction and integrating this children with autism because given that this children have special needs but they do observe other children in the play environment and consequently they develop the playing spirit also in them which does not bring them so much in a different view point as compared to the child who is considered to be normal".* The fact that these children have special needs, they are also considered to be in lacks so their play environment is adapted in such a way which will permit the children to learn how to know each other in the cause of their social interaction through playing with each other.

- **The development of the emotional skills**

Given the time these children have spent with the educators is enough for them to develop some emotional skills through the part that these children are really subjected to the habit of taking care of one another which in this process the children learn here to understand one another through the way they show their emotional skills. The children here are made to learn that taking care of each other is the best way of making their emotional skills to be revealed. "*we are a family that is why in this center we teach the children to be their own brother's keeper because it is very important for every child to know how to transmit his emotions towards his brother or sister before thinking of how to satisfy himself it. This is so because this is emotional transmition must pass through a person to another. that is why here you will see the children on the point of view of transferring emotions they do it by helping each other that is why you will see an autistic child even help another child when he is facing some difficulties*" the children here are very much concerned when comes to transferring emotions through the development of their emotional skills.

- **The reaction of the children to role playing activities**

As concerning the role play which consist of the child trying to the part of the person. In this exercise which is mostly practiced in the center which the main reason is passing the societal messages which must also be made known to the children given that it is an educational setting. In this center you will see this exercise during their classes when the educator trying to transmit a message or an information the educator has to show it through the acting by the children which will make them to better understand lessons "the *children here are in special needs but they are also citizens of Cameroon given that they also have the right to know what is happening around them. You were here when we were doing some acting on the theme on Cholera with the message of trying to instigate in them the fact the something exist like cholera which is caused by poor sanitary conditions which will bring them to also learn also during this role play they learn how to know the sufferings of others and also to take the place of this persons. But I must say when we do this activity their communicational skills are developed by this means.*" The role play here is a type of activity which puts the child in condition which makes the child to learn some certain environmental ills and so this is done in a type of repetitive way which makes the children to take the rhythm.

- **How the child reacts to problem solving**

In the center the educators depend on the part of the children developing abilities of solving problems by themselves here the children. Children here are trained which goes with the other trainings the children have been receiving in the center this is so because given that the school which use the Motesoriane pedagogy which is an alternative pedagogy. The children are left to create knowledge on them and letter it is just checked and corrected by the teacher this is so because the pedagogy believes that children can be able to create knowledge by themselves. *"When you talk about decision making, I see all what is done by our institute given that this school is under Montessori Cameroon. And so, the pedagogy here is alternative which is the children are meant to create knowledge and so we come in the part of decision making it is linked to all what I am telling you now."* With this we realize that in this center they do use a type of classical pedagogy because they believe on the autonomy of the children which will guide them towards making good decisions

CHAPTER 6: INTERPRETATION OF THE RESULT, DISCUSSION AND SUGGESTION

In the interpretation of the result the researcher makes the work comprehensive and to make sense out of the research work in this definition it is important to understand that in this chapter we shall be presenting the verification of our hypotheses which is discussed in our work. After doing this we are going to move to the interpretation of our result and there after we are going to give some suggestion which is going to make the research not to be locked but to affect the development of science. All these will be centered on the problem we have at hand.

6.1.1. Interpretation based on the observation of the autistic children and the interview on the Educators

In this research we used the of theme of "PECS" which we were to manipulate in order to observe a particular phenomenon which was to be used by us to bring our research to have certain degree of significance in the work of special educators. This particular phenomenon was to show how the use of the PECS approach contribute to grow elf-confidence in child with autism. We discovered that the children's needs more of the stimulants which will permit them to adapt in the educational environment. The child in particular here with the help of the educator must have some connection to permit him to access adaptability and this is so because the theory of social motivation state that the child is born with an innate motivation in him but due to the stereotypes which are present in the child, he is not able to adapt well in an environment which ask more from him, like neurotypical children.

6.1.2. PECS

We noticed the following improvements in our case after of observations and interviews with teachers and even the parents

Improved Communication Skills: PECS provides a structured and visual means of communication, allowing children with autism to initiate and maintain communication. Teachers and parents reported reported improvements in the child's ability to request items, make choices, and engage in basic conversations which directly translates.

Increased Independence: By using PECS, we all also discovered that our cases children learned to communicate their needs and wants more effectively, reducing frustration and promoting

independence. Also observed a decrease in challenging behaviors resulting from improved communication skills.

Enhanced Social Interactions: the use of PECS to our cases facilitated social interactions by enabling them to engage in joint attention and share experiences with others. Also noticed an increase in the child's engagement with peers, improved turn-taking skills, and an enhanced ability to participate in group activities.

Academic Progress: As communication skills improve, our cases were able to participate in educational activities and interact with teachers and peers. A progress in areas such as receptive and expressive language, pre-academic skills, and following instructions.

Generalization of Skills: With consistent use and practice, our children begin to generalize their communication skills beyond the structured PECS system. It was noticed that the child using communication strategies in various settings and with different communication partners.

6.2.1. Visual aids and Adaptability

As to what concern visual aids and adaptability, we noticed that our cases after of observations and interviews with teachers

The specific outcome of interviewing teachers in Einstein Pedagogic institute and observations regarding the use of visual aids and its impact on self-confidence development in autistic children, here are some potential results in which visual aids contribute to self-confidence in ore cases:

Improved Communication Skills: Visual aids provided a structured and visually supported way for cases with to communicate. They were able to express themselves effectively using visual, which enhance their sense of autonomy and self-confidence.

Increased Independence: By using, Visual aids children can learn to make choices, request items, and engage in social interactions. As they gain independence and become more self-reliant in their communication, their self-confidence improves.

Positive Social Interactions: Effective communication through visual aids helps our cases to engage more successfully in social interactions, both with peers and adults. As they experience positive social exchanges and build relationships, contribute to their self-confidence.

Self-Advocacy: As children become proficient in using, they can advocate for their own needs and preferences. This ability to express themselves and make choices can foster a sense of empowerment and self-confidence.

Moving through this concept we also realize that this concept is has some limitations in point where the educator has to know the child but has to be able to predict the wants of the child. In the child, the TOM is not developed as compared to the educator who has the ability to connect with the autistic child and even know the wants of the child. This is so because autistic children often display no interest about some social stimuli's so, this situation is a type of conditioning which must always be given to the child which they fail because during this work we realize that our case 1 which we realized he is always loved to be given some emotional lacks which is experienced by the child it's more advisable for educators to use this motivation as point of focus which will help to bring the child back to the educational environment. This so because when looking at the chart we realized that for all cases the bar which concerns their visual aids are down which is due to the lack of adaptation do not cross (7.5) which is half of the objective which is wanted from them as concerning Adaptability when using inclusion strategies.

6.3.1. Reinforcement

The result we got from reinforcement in regard to how it helps develop self-confidence in autistic children is very pertinent. Reinforcement is not only positive but also negative. To begin with the positive side, it is important to that every kid has his or her own personality and to how they react. From the tender age some of these children were considered as normal like any others and this retard their self-esteem. After their diagnostic and been brought to the center, some changes were observed. Their reactions toward others changed, they start developing confidence in themselves that after been praised for the success accomplishment for a task. The praises and rewords stimulate them to gain more confidence in themselves. Also, it is important to note that every child is supposed to have some breaks after doing so activities we realized that these children are very much pleased and really take into consideration the activity for this is a stimulant type of strategy which is used by the educators. Giving this type of activities of which must be given an accent given that children are much interested in it and so it is used as an object towards the child's Adaptability and confidence development. During this activity the child will obviously bring out the motivation which he has in him considering that the child has an innate

motivation which permit him to develop some educational adaptive behaviors give that the environment is a type of conditional one which is made for children with autism so, it is without escape that they adhere to the conditions. This so because the autistic children who just need preferable stimuli to bring out the motivation in them and as a result will make them to adapt more in the environment. given that when the educator sets the child and n a more conditioning environment which will bring comfort the child liberates himself.

Given the result we collected the bar of the sensory breaks brings us to understand the fact that sensory breaks here permit the child to open himself of in other to bring these children to really understand in their own way what is done in inside school or a mainstream school. Given that in the chart for sensory breaks case 1 and case 2 are more in a more adaptable solution. So, given the fact that these autistic children. Have problems which the TOM and also given the score of the children on sensory breaks this point must be used to really alert the children so this sensory breaks by educators are mostly used as a relaxation break of the children but on a more important and practical note it is to be used to bring up the children in their search for adaptation.

6.4.1. Social interaction

We obtained these results using social interaction to our cases helping to in the development of them to self-confidence in the following ways:

Improved Social Skills: Engaging in social interactions our cases had the opportunities to practice and develop their social skills. Through interactions with peers and adults, they learned and refined skills such as turn-taking, sharing, listening, and initiating conversations. As they become more proficient in these skills, their self-confidence in social situations improved.

Increased Self-Awareness: Social interactions on our cases helped develop self-awareness by providing them with feedback on their behaviors and how they are perceived by others. Understanding social cues and norms can enhance their ability to navigate social situations with greater confidence.

Positive Relationships: Building positive relationships with peers and adults fostered in them a sense of belonging and acceptance, which significantly impact self-confidence. Meaningful connections and friendships provide emotional support, opportunities for collaboration, and a sense of social connectedness.

Peer Modeling and Learning: Interacting with neurotypical peers of some of our cases offered valuable opportunities for peer modeling and learning. Observing and imitating the social behaviors of their peers helped them develop and refine their own social skills, boosting their confidence in social interactions.

Self-Expression and Assertiveness: Engaging in social interactions allows our children to express themselves, share their ideas, and assert their needs and preferences. When their thoughts and opinions are respected and acknowledged by others, it strengthened their sense of self and boost self-confidence.

- **Role playing**

the use of role plays and its impact on self-confidence development in autistic children, provide insights on how role play may contribute to self-confidence:

Social Skills Development: Role play provided a safe and structured environment for our cases to practice and develop social skills. By engaging in pretend scenarios, they learned and practiced appropriate social behaviors, communication skills, and problem-solving techniques. As they gain confidence in navigating social situations through role play, it positively impacts their self-confidence in real-life interactions.

Empathy and Perspective-Taking: Role play allowed them to take on different roles and perspectives, which enhance their understanding of others' emotions, thoughts, and experiences. Developing empathy and perspective-taking skills contribute to improved social interactions and self-confidence by fostering a deeper understanding of social dynamics.

Self-Expression and Creativity: Role play provides an outlet for self-expression and creativity. Through assuming different roles and engaging in imaginative scenarios, explore their interests, ideas, and emotions. The opportunity to express themselves freely and creatively can boost self-confidence and foster a sense of individuality.

Problem-Solving and Decision-Making: Role play often involves navigating various challenges and making decisions within the context of the scenario. By actively participating in problem-solving and decision-making during role play, permitted our cases to develop critical thinking skills and gain confidence in their ability to handle different situations.

Confidence in Trying New Roles and Behaviors: Role play allows our cases to experiment with different roles, behaviors, and social scripts in a supportive and non-judgmental environment. This helped them overcome fears, build resilience, and develop confidence in trying new approaches or behaviors in real-life situations.

6.5.1. On the social motivation

motivation and its impact on self-confidence development in our children had the following results which contributed to development of self-confidence:

Increased Engagement and Participation: Social motivation enhanced engagement and participation in various activities. When they feel motivated by social interactions and connections, they are more likely to actively participate, which lead to a sense of accomplishment and increased self-confidence.

Positive Peer Interactions: Social motivation can facilitate positive peer interactions, which are crucial for self-confidence development. When autistic children feel motivated to engage with peers, form friendships, and experience positive social exchanges, it can contribute to a sense of belonging and self-assurance.

Social Validation and Recognition: Social motivation led to increased social validation and recognition from peers and adults. When autistic children receive positive feedback, praise, and acknowledgment for their efforts and achievements, it can boost their self-esteem and self-confidence.

Opportunities for Skill Development: Social motivation encouraged our children to develop and improve their social skills. When they are motivated to engage in social interactions, they gain more opportunities to practice and refine their communication, social cognition, and emotional regulation skills, which positively impact their self-confidence in social settings.

In the case 1 was such in a position where he had to be pushed by some emotional stimuli before he did the task, we gave to him in this process. That is during activities he always wanted to be touched and also cajoled before he had to do what was require from him by the educator. In this we understood that it is important to leave the children to show their motivational desires which from there now we understand what is to be done by the educator.

During this activity the subject really took them seriously, this so because when the child is understood, he leaves his motivational desires to adapt and gain self confidence in what he is asked to do. From this we felled that even our presence put the child in a situation where he could better work or do what is required for him even when there is no action, because the

schedule in the activities makes it in such a way that the child is being repeated one and the same activity for him to take an adaptive behavior towards that same activity.

On the part of the social motivation, we realized that during activities which were taking place, when it is taken in a playful way it stimulated the children to develop more compared to just giving them an activity to do without really concentrating on the stimulation part of the work. In this process we discovered the child really needs some a stimulant which can be social to bring out their adaptive capacities and to develop their self-confidence.

Generally, on the point of using the social motivation which helped us to know the way to handle our subjects we realized in the start that they were in a state which the time of learning and a transition between the programs but with the strategic intervention the subjects were able adapt to the situation and boost their self-esteem which makes the subjects to be aware of the activities and their impacts

6.5.2. The development of self-determination
From the research we conducted on the field we realized from the beginning that these autistic children to developed self-determination through these activities which were meant as an object of the self-confidence to the children. We realize in our research that on the [part of visual aids which have to do with the activity organization of the center, the children did not develop much adaptive behaviors during this activity. This was so because we discovered the activities that are conducted here mostly did not give the children some interest that is why most of them during the learning session which is part of their activity schedule did not make them to show any sign of interest and even the one of self-determination.

6.5.3. The development of self-assessment
On this part, the children did not really concentrate in as much as the work done on them is on the part of self-assessment. Decision making which we got from our result we realized that the children are emotionally covered by the educators to take decisions which is equal as being self-determined. Therefore, looking at the result we realize they had a low mark on this part because all the three subjects scored mostly a fair mark which was the lowest on our observation scale. However, their self-confidence is not affected.

6.5.4. Development of Self-support

On the part of self-support, the children sometimes cannot control their anti-social behaviors due to their stereotypes behaviors which they have and so this makes them in some cases not to control their stereotypes behaviors in some activities but we came to understand that during activities which had to do with playing the children were very much relaxed and also developed signs of self-control which at that point eliminate their anti-social behaviors in the educational environment. On the observation scale, we can see that on the part of sensory breaks the children are much more relaxed and they do not really have much worries on this part.

6.6.1. Discussion of result

The general objective here is to shows that the PECS approach for mentally disabled persons contribute to the development of self-confidence in children with autism. We have the principal hypothesis as: PECS approach contributes to the development of self-confidence in children with autism. So, inspiring ourselves from other works that have been done by other authors who conducted works on self-confidence development in autistic children, it is important to note that, a child who is adapted on the educational environment easily gain confidence on him or herself. We can therefore say the following:

- organize programs in the child's mind (cause the when these strategies are well organized by the educators to the children to make the autistic children have a type of organized mind)

- The full esteem of self (develops competence, global esteem of self and knowledge of capacities)

- The external perception of wellbeing (the quality of life and social perception)

In these three points that are being presented for mentally disabled the

6.7.1. The suggestions

In this part we are going to talk on some setbacks and limitations of the PECS approach in regards to self-confidence development in autistic children. All these with the objective of changing the conditions which are given to the children in the school setting. It is a way of really bringing these strategies to the inclusion and specialized school which has to make them to insist

more on the psycho-educative which was made by special educators. Our research is supposed to bring and give more light to the public authorities and the authorities in charge.

- **To the public educators in charge of special education and education in Cameroon**

We are suggesting to the public authorities from the ministry of basic education to create some programs which are responsible of making the curriculum of special education schools to concentrate on the children's interest. Because the children being very different from the others and concentrate more on the programs which will put the children on play environments depending on the level of their disability. This is so because the children here are very interested in playful activities.

So, the suggestion is a close collaboration between the special educators and the ministry of basic education to build a better program which are closely related and know the children better than the ministry who draw the program of learning. So, the Ministry has do an evaluation of the yearly performance of the children, this will help in the evaluation of the teaching technics which are given to the children. The teaching programs should be made with an originality to the mentally disabled children which is using their teaching technics so as to help them to adapt to the educational environment and not using a typed of mixed technics.

- **To the UNICEF and to the NGO**

We call on the NGO's and the UNICEF in the use of inclusion which are original to the mentally disabled persons.

We ask the NGO's to better use the special educators which are better placed in making technics depending on the level disability of the children. This is so because when normal teaching technics are used on the children, they have no effects but when adapted technics are used on them, they are effective and the stimulation that is needed by the children in order to better be motivated.

- **To the school administration**

The school administration has to be aware of the needs and also know how to use the technics which are used by the educators knowing that the educators are very much included in the process of education, but they still sometimes use the normal teaching technics forgetting that these children have specific needs and do not see or even interpret things the way neurotypical

children do. So, all these reasons have to be centered on the interest of these children as a focus of making them to adapt better to the educational strategies.

CONCLUSION

From our above analysis, it is important to note that autistic children are not like others and therefore this makes it a call for special attention in their lives. The question of self-confidence development with the use of the PECS approach is very necessary pertinent in autistic kids because they are call to live in a society where many activities are carried out. Throughout this research therefore, we discovered that each autist child has his or her level of disability and has to be handle with care. In order to solve therefore a particular problem in the life of autist, one is advice to be patient also show a lot of interest in the life these children. And so, we can say that the correct use and implementation of the PECS approach helps to increase and develop self confidence in children living with autism. Picture Exchange Communication System (PECS) has shown promise in promoting self-confidence and communication skills in children with autism. Research suggests that using PECS can help children with autism to communicate their needs, make choices, and interact with others, leading to increased self-confidence and independence. However, it is important to consider individual differences and the need for a comprehensive approach that includes various interventions and supports tailored to the specific needs of each child. It is important to note that (PECS) can significantly contribute to the development of self-confidence in children with autism. PECS provides a structured and visual method for communication, which can help children with autism to express themselves and interact with others more effectively. This improved communication can lead to increased self-confidence as children are better able to understand and navigate their environment. Additionally, the use of PECS can also help children with autism to develop their social skills, further contributing to their overall confidence and well-being. Overall, the research suggests that incorporating PECS into interventions for children with autism can have a positive impact on their self-confidence development. Picture Exchange Communication System (PECS) approach has proven to be a valuable tool in fostering self-confidence in children with autism spectrum disorder (ASD). By providing a structured and visual means of communication, PECS empowers children with ASD to express their needs, wants, and feelings effectively, thereby enhancing their self-esteem and overall confidence. One of the key strengths of the PECS approach lies in its ability to individualize communication strategies to match the unique needs and abilities of each child. This personalized approach allows children with ASD to develop

communication skills at their own pace, gradually building confidence as they achieve successful exchanges and interactions. Additionally, the systematic progression of PECS, starting with simple requests and progressing to more complex communication, provides a sense of accomplishment and mastery for children, further boosting their self-confidence. Furthermore, the use of visual supports in the PECS approach helps children with ASD overcome challenges related to receptive and expressive language skills. The visual cues and prompts provided by PECS aid in comprehension and understanding, reducing anxiety and frustration often experienced by children with ASD in communication situations. As a result, children feel more capable and empowered to engage with others, leading to increased self-assurance and self-confidence. Moreover, the use of PECS extends beyond immediate communication benefits. As children with ASD become more proficient in using PECS, they acquire valuable skills such as turn-taking, social interaction, and problem-solving. These additional skills contribute to their overall development and sense of self-efficacy, reinforcing their self-confidence and enabling them to navigate various social and academic environments more effectively. It is important to recognize that while the PECS approach can significantly enhance self-confidence in children with ASD, it should be implemented in conjunction with other evidence-based interventions and strategies tailored to the individual needs of each child. A comprehensive and multidimensional approach that addresses various aspects of ASD, including communication, social skills, and sensory sensitivities, can further support the development of self-confidence in children with ASD.A

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General presentation of results

Artistic skills	Fair3	Poor2	Good4	Excellent6
Their reactions to songs and music	✓			
How they react towards drawing and painting activities		✓		
How the children relate to sport activities				

Presentation in regards to each case

Case 1

Reinforcement	Fair3	Poor2	Good4	Excellent6
Their reactions after accomplishing a certain task and been praised	✓			
The impact of encouragement and its contribution to the educational growth of the child			✓	
Children's reactions after accomplishing a certain task and been reworded		✓		

Social interaction	Fair3	Poor 2	Good 4	Excellent6
Child's reaction to role play				✓
Evaluate the child's development emotional skills	✓			

The children's reaction when faced with problem solving				

Case 2

Artistic skills	Fair2	Poor3	Good4	Excellent6
Their reactions to songs and music	✓			
How they react towards drawing and painting activities			✓	
How the children relate to sport activities			✓	

Reinforcement	Fair2	Poor3	Good4	Excellent6
Their reactions after accomplishing a certain task and been praised		✓		
The impact of encouragement and its contribution to the educational growth of the child			✓	
Children's reactions after accomplishing a certain task and been reworded			✓	

Social interaction	Fair3	Poor 2	Good 4	Excellent6
Child's reaction to role play				✓
Evaluate the child's development emotional skills		✓		
The children's reaction when faced with problem solving	✓			

Case 3

Artistic skills	Fair3	Poor2	Good4	Excellent6
Their reactions to songs and music				✓
How they react towards drawing and painting activities			✓	
How the children relate to sport activities			✓	

Reinforcement	Fair3	Poor2	Good4	Excellent6
Their reactions after accomplishing a certain task and been praised		✓		
The impact of encouragement and its contribution to the educational growth of the child			✓	
Children's reactions after accomplishing a certain task and been reworded				✓

Social interaction	Fair3	Poor 2	Good 4	Excellent6

Child's reaction to role play	✓			
Evaluate the child's development emotional skills				✓
The children's reaction when faced with problem solving			✓	

INTERVIEW GUIDE

Dear Sir/Madam, we are conducting a study as a part of our university research on; "The picture exchange communication system approach and self-confidence development in children with autism". We will kindly ask you to answer this interview guide in all sincerity and we assure you of the confidentiality of the information we will obtain from you, according to the code of the profession in educational psychologist.

0-Socio-demographic information of the participant

-Date and place of interview …………………………………………………………………

-Time and start…………………………………………………………………………………….

-Age of respondent……………………………………………………………………………

-Educational level…………………………………………………………………………….

-Profession……………………………………………………………………………………

During this interview I would like to discuss with your certain events related to the way autism is being handled by you. So, I will be as fast as possible, go through a set of themes that I will propose to you. But in the meantime, tell me a little about the children and their autistic problems.

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0-Theme 0: Brief History of the participant

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I would now like us to discuss the following themes that I will propose to you.

Theme 1: Artistic kills

Sub-theme1:   How   do   u   make   their   activity   schedule?
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Sub-theme 2: How do you handle issues with decision making when it comes to artistic activities?
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Sub-theme 3: How do the children respond to symbol exchange?

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Sub-Theme 4: How do the children react to social activities?

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 Theme 2: Positive and negative reinforcement

Sub-theme 1: what are do you observe on the child during certain reinforcement activities?

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Sub-theme 2: Does encouragement really contribute to the self-confidence growth of the child?

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Sub-theme 3: How do you use rewards as a way of improving or boosting their level of self-confidence thee children?

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Theme 3: social interaction

Sub-theme 1: How does the child react to role play?

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Sub-theme 2: How do the children develop emotional skills?

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Sub-theme 3: what is the children reaction when faced with problem solving?

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Some images of PECS

Standard

Small

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play ball	go for a walk	run	bounce on ball
trampoline	bowling	rollerblades	stretch
ride bike	park	playground	skateboard
ride scooter	camp	soccer	swing
play	basketball	swimming	skate