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Unveiling the Effectiveness of Professional Training on Spectrum Disorder for Special Education Teachers: Promoting Education for Autistic Children

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Dedications

To my parents who have shaped my life and believed in me even when I did not believe in myself.

To my father: Your memory lives on in every step I take. Your guidance, love, and strength continue to inspire me every day. Though you are no longer here, your spirit remains a constant source of motivation and courage.

To my mother: Words can hardly describe my thanks and appreciation to you. You have been my source of inspiration, support, and guidance.

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To my sisters' husbands and my lovely nieces, whom I am truly grateful for having in my life.

To all my friends, family, teachers, colleagues, and all the people who have influenced my life.

Chebil Ikram

Dedications

I dedicate this work to my beloved parents, who were my support and inspiration throughout this journey, and to everyone who has supported and believed in me.

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Abstract

There is a growing number of children with Autism Spectrum Disorder in Algeria, the current study sheds light on the effectiveness of professional development programs focused on autism spectrum disorders (ASD) for special education teachers from different educational centers in Tiaret, Algeria. This research addresses the gap in understanding how professional training impacts the ability of teachers to provide innovative strategies for autistic children. The main objective of this research is to emphasize the role of special education teachers' professional training in providing innovative strategies and addressing autistic children's needs. We used a mixed-method approach, combining quantitative content analysis and qualitative data regarding teachers' perspectives on the professional development program, their self-efficacy, and the implementation of strategies in the classroom, and data were collected from a sample of 60 special education teachers using surveys and interviews. The results reveal that even though professional development greatly improves teachers' knowledge and skills, there are still difficulties in applying those skills in the real world because of a lack of practice opportunities. Furthermore, the study emphasizes the positive influence of psychologist-recommendation strategies on educational interventions in order to make educational programs effective for autistic children. Also, the results highlight the necessity of continuous and focused training to improve teaching approaches for children with ASD, and confirm that professional training and sustained support are essential for special education teachers.

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List of Abbreviations and Acronyms

Abbreviations

3D: Three-Dimensional

ABA: Applied Behavior Analysis

APD: Auditory Processing Disorder

CE: Continuing Education

DSM-V: Diagnostic and Statistical Manual of Mental Disorders

ERIC: Education Resources Information Center

GPU: Graphics Processing Unit

IDEA: Individuals with Disabilities Education Act

IDEIA: Individuals with Disabilities Education Improvement Act

IEP: Individualized Education Program

LED: Light-Emitting Diode

PDD: Pervasive Developmental Disorder

PDD-NOS: Pervasive Developmental Disorder-Not Otherwise Specified

Acronyms

ADNP: Activity-Dependent Neuroprotective Protein

APPGA: All-Party Parliamentary Group on Autism

AR : Augmented Reality

ASD: Autism Spectrum Disorder

GABA: Gamma-Aminobutyric Acid

PRAXIS: Professional practice framework used to evaluate the effectiveness of teacher education programs

TEACCH: Treatment and Education of Autistic and Communication-Handicapped Children

VR :Virtual Reality

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General Introduction

Autism spectrum disorder is the most common severe developmental disability affecting children and is also the one that is growing the fastest. The increase in the number of children suffering from autism spectrum disorders has automatically raised the number of enrolled in specialized centers. Since there is an escalating number of children living with ASD, it means that every special education teacher must know more than just general information about what makes these children different from others as far as understanding them is concerned. Learners with ASD require considerable attention in terms of psychological care, learning program adaptation, and qualified special needs teachers, who are compelled to provide suitable learning conditions. This study addresses the role of professional development on autism spectrum disorders for special education teachers and what implications it imposes on disabled children and special needs teachers.

Professional development for teachers is an important issue it plays a pivotal role in enhancing instructional practices, keeping educators abreast of the latest pedagogical trends, and fostering a dynamic learning environment. Continuous and targeted professional development equips teachers with updated knowledge and skills, ensuring they are well-equipped to address the evolving needs of students with autism. Therefore, providing professional development opportunities can significantly enhance the qualifications of teachers and improve the learning outcomes for students with ASD.

Our empirical study is guided by the following objectives:

1. To examine the effectiveness of professional development programs focused on autism spectrum disorders (ASD) for special education teachers.
2. To explore how special needs instructors overcome the issue in the teaching process of disabled learners with the contribution of targeted professional development programs.
3. To know about innovative strategies approved by psychologists to promote appropriate educational interventions for autistic children.

In light of all that has been mentioned, three research questions are formulated so as to investigate the contribution of teachers' professional development on autism spectrum

disorder in promoting the autistic child's academic performance and social skills, they are outlined as follows:

Q1) How does professional training shape teachers' perception of children with Autism spectrum disorder?

Q2) What is the effectiveness of professional training in promoting educational interventions with Autism spectrum disorder children?

Q3) How do psychologists contribute to the development and implementation of creative approaches to support suitable educational interventions for children with autism?

To answer these questions, three hypotheses are suggested:

1) Participation in ASD-focused professional training programs will increase special education teachers' attitudes, skills, and knowledge.

2) Professional training on autism spectrum disorder can have a positive impact on special needs instructors in providing them with the necessary tools and strategies to enhance their efforts in addressing the diverse needs of learners with ASD.

3) Implementing innovative strategies endorsed by psychologists, such as sensory integration techniques individualized learning plans, and behavioural intervention, will significantly enhance and facilitate appropriate educational interventions for children with autism.

The current study involves three chapters. The first chapter is devoted to the literature review, which describes concepts and theories related to the topic of our investigation, it provides an introductory overview of ASD, highlights challenges faced by both students and special education teachers, emphasizes the importance of professional training, and explore the positive outcomes and models of training programs. Additionally, it delves into the effectiveness of current training programs and the role of psychologists in contributing to teacher training. On the other hand, the second chapter describes the methodological framework; particularly the research design, methodology, target population, and the various processes to analyse data. Additionally, the third chapter addresses the main findings and outcomes. and offer suggestions and recommendations to assist educators, parents, psychologists, and authorities in supporting individuals with ASD.

Chapter One: Literature Review: Teacher Professional Training

1.1 Introduction

Autism Spectrum Disorder (ASD) stands out as the most prevalent and rapidly growing severe developmental disability affecting children. In Algeria, as in many parts of the world the rising enrollment rates of children with autism, Down syndrome, and mental retardation in private institutions correlate with the growing number of diagnoses of autism spectrum disorder. The current chapter is going to delve deeply into learning disorders including autism spectrum disorders and their implications. Further discussed its causes, characteristics, and difficulties faced by autistic children. It will also explore means of assisting children with autism as well as what special educators need to know before entering this field. The chapter will also highlight the importance of training for special education teachers helping them better understand and help autistic children.

1.2 Overview of Learning Disabilities

According to Parkin (2016), certain individuals with average or above-average intelligence have struggled to acquire important academic skills. These skills have included successful reading, writing, listening, speaking, and comprehending new or complex information. The origins of such challenges may have been attributed to learning difficulties. When learning difficulties have been experienced at an early age, they have been carried on till later life. It has become hard for kids or teens in such situations to have mastered simple tasks. In simpler terms, this phrase has referred to different situations, ranging from simple cases that can be handled gradually to very complex ones that affect all aspects of one's life. Intellectual disability has exhibited different manifestations in each individual, showing how wide it could be (Understanding Developmental Delays and Disabilities, 2022).

Parkin (2016) has highlighted that children with learning disabilities, like those with autism spectrum disorder (ASD) and other developmental disorders, might have had delays in basic skills such as learning to speak, walk, dress themselves, or eat. Similarly, their journey may have demanded more time than their peers. In adulthood, some individuals with intellectual disabilities, such as those with Down syndrome, can have achieved independence in the community without outside help. In contrast, others with more severe intellectual disabilities with difficulties in relationships may have needed considerable support throughout their lives. Notably, a small percentage may have contended with enduring challenges to functioning. Nevertheless, early intervention, suitable education, and ongoing adult support can have empowered every person with an intellectual disability, including those with autism and other disorders, to lead a meaningful, satisfying life within the community (Understanding Developmental Delays and Disabilities, 2022).

People often have said that they are less productive on their disability days than on their usual productive days. Except, the number of people with sensorineural hearing loss only accounts for about 90%, while there are still a bunch of disabled people who will be able to

hear anything -one kind of these disabilities is Auditory Processing Disorder (APD), which doesn't enable the brain to receive any sound. This difficulty has made it more challenging to: detect subtle differences in speech sounds, identify the source of sounds such as a telephone ringing or birds singing, sequence auditory information (e.g., listening to directions and then telling someone else what they heard), and integrate auditory processing skills with memory skills. An example of a specific learning disability is Dyscalculia, which is the loss of mathematical skills through interference with simple arithmetic procedures, number memorization, or understanding of mathematical symbols. A writing problem, Dysgraphia is a particular type of learning disability that has influenced handwriting and it has caused the appearance of written work to be messy, incorrectly arranged spatially, and also full of bad spelling along with inhibited expression (Center for Parent Information and Resources, 2022). Dyslexia, a widely known learning disability, has affected reading fluency, the sounds of speech as well as spelling, and difficulties learning to speak.

Comprehension of verbal and language processing disorders and recall of associated auditory stimuli auditory memory has had a different clinical profile than non-verbal learning disabilities NLD, which have seen a significant discrepancy between stronger verbal (learned) skills and weaker motor, visuospatial, social-relational, and other abilities impacting everyday life. Similarly, visual perceptual dysfunctions, which are far more common and may be associated with learning disabilities such as NLD and/or dysgraphia, have impaired the way visual stimuli is interpreted, resulting in problems processing shapes, focusing on letters while reading or writing for an extended period, manual dexterity and spatial relationships. Recognizing each of these definitions as separate and unique disability has been essential for program design-- it was only when the development of appropriate interventions to proficiently meet a variety of cognitive needs could even be considered (Lyon, 1996). In the study, we have shed light on one of the most challenging learning disabilities in our context, which is autism spectrum disorder.

1.2.1 Definition of Autism Spectrum Disorder

Autism spectrum disorder (ASD) has stood out as the most debilitating and enigmatic childhood developmental disorder. A trio of deficits has characterized ASD; including communication, social interaction, restricted and repetitive patterns of behaviour, interests, and activities. Based on the diagnostic criteria outlined in the Diagnostic Statistical Manual of Mental Disorders (DSM-V), autism has currently been categorized into three levels: mild, moderate, and severe. These levels have been described, sequentially. Mild individuals have encountered challenges initiating social interactions, have shown marked difficulty with social interaction, and have had trouble communicating when they did not receive support (Mazurek et al., 2019). Moderate individuals have shown greater difficulty communicating with verbal and nonverbal skills and have often responded little or atypically to communication efforts. Those classified as third and final level have experienced severe deficiencies in verbal and nonverbal social communication skills (Lord & Bishop, 2015; Kizir & Yıkmiş, 2016; Mazurek et al., 2019). Children diagnosed with

ASD have experienced some challenges throughout the pre-linguistic developmental phases.

Flippin and Watson (2018) have emphasized that the language abilities of children with ASD are diverse and varied. One particular skill that has set children with ASD apart from typically developing children during the preschool years has been their ability to coordinate attention among people, objects, and events in the social environment. This skill, known as general attention, can have been used as an indicator of the simultaneous development of future language skills in children with ASD.

Hilt and Metz (2008) and the World Health Organisation (2006) have viewed Autism Spectrum Disorder (ASD) as a range of developmental disorders that are closely connected as regards neuro-biology, such as Autistic Disorder, Asperger's Disorder, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), Childhood Disintegrative Disorder and Rett's Disorder. Autism Spectrum Disorder (ASD) has been considered to be one of the most debilitating and enigmatic developmental defects of childhood due to the presence of an atypical developmental trajectory that has affected different functional domains. With time, definitions and limits for ASD have completely changed. For quite some years now, Autism Spectrum Disorder (ASD) definitions and boundaries have changed drastically. This has created a complex and confusing vocabulary for clinicians to navigate. Autism spectrum disorder has often been referred to as autism, but it can have been called childhood or infantile autism in some cases. Rett disorder has also been known as high-functioning autism; thus, some illness may have become a syndrome rather than remain merely Rett disorder.

Pervasive Developmental Disorders Not Otherwise Specified (PDD-NOS) have sometimes been referred to as Pervasive Developmental Disorders (PDD). While an all-encompassing term for the whole five conditions has been ASD, for example, sometimes it has been said to be autism as Autistic Spectrum Disorder (Freitag, 2007; Strock, 2007). It has been worth noting that children with ASD have often shown greater interest in adult facial expressions compared to their typically developing peers. Furthermore, even in adulthood, individuals with ASD may have had difficulty recognizing complex emotions, expressing their emotions, and making eye contact with others. Children with autism have often exhibited symptoms of surprisingly little language development. Additionally, their capacity to imitate sounds and movements has tended to be weak, and they may have encountered challenges in differentiating objects. Findings have indicated that autistic children have demonstrated varying degrees of competence in all domains of language. However, the limited early diagnosis of ASD has made it difficult to study advanced phonological development, an essential component of language acquisition (Mitchell et al., 2006). Some individuals with ASD may have exhibited phonological deficits, while others may not. Children with ASD have struggled with grammar development and have had difficulty putting meaningful words together. Studies on semantics in children with ASD have yielded varying results. Additionally, they have encountered obstacles to comprehend certain verbs that pertain to mental states, such as knowing, thinking, and remembering. Children with Autism Spectrum Disorder (ASD) have often exhibited a phenomenon

known as echolalia, where they repeat a sentence, phrase, or word. However, in some cases, individuals with ASD may have had shared echolalia where they repeat a sentence or word they heard even after several days or weeks passed (Kaçar, 2012).

1.2.2 Causes of Autism Spectrum Disorder

The causes of Autism Spectrum Disorder (ASD) involve a variety of factors, including genetic tendencies, environmental impacts, and the way a person develops. Based on information from Medline Plus Genetics (2021), More than 1,000 genes have been discovered that could be connected to ASD, although many of these connections still need to be confirmed. Scientists think that several common gene variations might increase the chances of developing ASD. However, not everyone will be affected by the disorder. On an individual level, the impact of most gene variations is relatively minor. Genetic factors are estimated to contribute between 40 and 80 percent of the risk associated with ASD. The risk of developing this complex disorder is speculated to arise from a blend of genetic mutations and environmental risk factors such as parental age, birth difficulties, among others unknown variables. Conversely, it is estimated that less than 5% of people with ASD, from 2 to 4% actually have the syndrome because of rare gene mutations and chromosomal abnormalities. Syndromes generally demonstrate further symptoms across different body parts after mutations have been discovered. One such mutation occurs in the gene known as Activity-Dependent Neuroprotective Protein (ADNP) leading to a condition referred to as ADNP syndrome. Besides from autism spectrum disorders (ASD) plus impaired cognitive development, one could identify distinct facial features among others as hallmarks of this condition. Similarly, other genes have rare mutations associated with ASD, often most autistic children due to uncommon gene mutations have extra signs and symptoms. These mutations are typically located in just one gene. Numerous genes linked to ASD play a role in brain development. The proteins these genes make affect several parts of the brain's development like the creation, growth, and organization of nerve cells (neurons). (Medline Plus Genetics 2021)

Yanovski et al. (2015) consider that ASD is not a simple genetic disorder as was claimed by Szatmari (2003). Developing Autism Spectrum Disorder (ASD) is significantly affected by environmental exposures during pregnancy and childhood. These include maternal infections such as the rubella virus, exposure to toxic chemicals like pesticides or air pollution, and maternal stress levels while pregnant (for example). Additionally, it has been postulated that ASD occurs because some kind of gene regulation happens through epigenetic means where genes are expressed differently without changing their DNA code itself. Changes in the environment can lead to differences in how genes are expressed, a process that could impair the way the brain develops. ASD has been associated with immune responses, and there is data to indicate that when mothers experience these heightened immune reactions during this time they may deliver children later diagnosed with Autism Spectrum Disorder (ASD).

ASD children often have differences related to their brains' nerves: changes in their brains' architecture, connectivity, and operation. During their early brain development, some factors might have caused these distinctions. The focus of researchers has been on

gut microbiota in Autism Spectrum Disorder (ASD) studies. There exist differences between the types and functions of microorganisms found in the intestines of people suffering from ASD and those who do not suffer from it. Although the gut microbiome and ASD connection is not yet fully comprehended, children with ASD frequently undergo variations in sensory processing such as an increased or decreased sensitivity to sensory input that affects their social interactions and behavior. Yanovski et al. (2015)

Many aspects of the society and environment interact to produce various Autism Spectrum Disorder (ASD). Parents raising their babies, the existence of early intervention programs, and the socio-economic status greatly mold ASD symptoms and their intensity. Additionally, scientist believe that these biological process are affected by damage to some chemicals in brain such as serotonin, dopamine and gama-aminobutyric acid (GABA). On a different note, the relation of genetics with environment adds up more complication in understanding the condition of autism because varied environmental conditions have different effects on children depending on their genetic make up.

However Multiple non-genetic factors such as environmental exposures contribute to the occurrence of ASD and involve conditions like maternal infections as well as pollutants which would potentially interfere with the development of fetal brain. ASD risk arises from poor maternal health; including stress-related disorders amongst other illnesses and other complications that occur at birth including preterm labor or/and delivery, intra-uterine growth restriction, and fetal hypoxia. Lack of essential nutrients such as folic acid, vitamin D, and omega-3 fatty acids during pregnancy can affect brain development Pathological changes that occur in the cortex, particularly in terms of its structure and connectivity are usually attributed to ASD (Habib, 2019).

1.2.3 Difficulties of Autistic Children

Many children have been diagnosed with a developmental difficulty that is associated with Asperger's disorder (ASD), a form of autism, more than before. This has led to some children who have felt that they have it, pursuing higher learning, and now such children have been numerous in higher education settings just like everyone else. While they can have excelled academically, individuals with ASD may have exhibited peculiar or eccentric behaviours and have had unique interests. This can have posed challenges for instructors to accommodate their presence in the classroom. Many students diagnosed with autism spectrum disorder (ASD) have faced challenges in social interactions, both in verbal and nonverbal communication (American Psychiatric Association [APA], 2013).

Children with ASD may have struggled to comprehend others' perspectives, have experienced difficulties taking turns during conversations (language pragmatics), have spoken in a loud or monotone voice, and have had trouble understanding sarcasm, abstract language, and certain forms of humor. In a classroom setting, they may have become fixated on specific topics, monopolized class discussions, or chosen not to speak at all. Children living with autism have had a tendency to isolate themselves. They also have experienced difficulties in relating with others. This challenge has mostly been noted in new environments like those of universities which may have appeared as if their acts were

predetermined or unwelcoming. It has been evident that autistic college students have depicted repetitive behavior and restricted patterns, for instance, as the American Psychological Association-APA (2013) has postulated. Such behaviours have corresponded to difficulties adapting to changing circumstances; these might have led up to difficulties, such as alterations in assignments or seating arrangements, and heightened sensory sensitivity towards fluorescent lights, sounds, or smells. Also, children have had trouble keeping track of time, which they may have lost and thus failed to attend the classes required or reported excessively early to get seats they preferred (Dillon, 2007). However, such features have still existed as difficulties in themselves.

Autism spectrum disorder (ASD) has encountered several obstacles regarding social, communication, sensory, and behavioral areas (Lord et al., 2018). In other words, children who have suffered from autistic disorders have met serious difficulties when it comes to managing social interactions. One of the core challenges they have experienced is maintaining eye contact, which is an important aspect of non-verbal communication. Recognizing facial expressions has become more complex, making it more challenging to experience emotional nuances throughout interactions (Baio et al., 2018).

Moreover, individuals with ASD have struggled to comprehend social cues, which are essential for appropriate responses and behaviors in social situations. These challenges have collectively hindered effective engagement. Communication obstacles have been evident through delays in spoken language development, repetitive language patterns, and difficulties with nonverbal communication. Additionally, sensory sensitivities have contributed to a unique sensory experience, characterized by heightened or diminished responses to stimuli. Repetitive behaviors and a strong adherence to routines have been common, as have cognitive challenges related to executive functioning and restricted interests (Leekam et al., 2011). Correspondingly, it has been crucial to highlight early support and embrace inclusive methods to promote the overall health and growth of people with autism spectrum disorders.

1.3 Autistic Children and Education

Children with autism spectrum disorders have faced developmental effects that can have impacted their educational goals and performance. Consequently, these children have often been among the hardest to support in educational systems (Bryson et al., 2003; Emam & Farrell, 2009; Humphrey, 2008). Education systems have needed to use tailored strategies when addressing the needs of autistic children if they are to have provided them with an optimal school environment. In the field of special education, a crucial aspect has been the development of the Individualized Education Plan (IEP). It has been a tailor-made document for each student which has included information like their yearly academic performance review or any goals they might have set for themselves during a given period, details about available aids or therapies as well as other kinds of assistance. IEPs have supported different needs and learning preferences for disabled pupils, leading to an individualized and comprehensive educational experience through tracking development and changing needs. This has been ensured by IEPs because the Individuals with

Disabilities Education Act (IDEA) has emphasized progress-monitoring and flexibility in meeting changing needs (Smith et al., 2006).

Changes may have been required in classrooms in order to cater for children who are touchy about their environment. This has been important so that everyone can have learned in a comfortable environment. Special education teachers have played a crucial role in assisting children in grasping concepts, adapting teaching methods, and providing additional support when necessary. Enhancing communication abilities has involved expressing oneself effectively and comprehending others. Enhancing the sense of belonging and inclusion among autistic children has involved teaching them social interaction skills. Also, it can have been difficult for these children to strictly adhere to routines, and thus they have needed flexibility. There have been times when using certain types of therapies, such as speech therapy and occupational therapy, might have assisted individuals in mastering essential abilities (Myles et al., 2020).

Helping autistic children with social interaction training to navigate social interactions with their peers and engage others has been crucial. There have been many hurdles they might have come across due to this, therefore we have needed to be prompt in changing their routines since sticking to a strict schedule might not have been easy for them.

One has also needed to plan for transitions as autistic people go through various levels of their education. A good understanding of these transitions' peculiar problems on autistic students has been needed while they are moved through grades. It has been important to note that some people who are gifted in math could have been suffering from autistic disorder, so it has become necessary to help them focus on their other abilities and strengths as well.

1.3.1 Autistic Children Needs

Autistic children's diverse needs have cut across various aspects of their growth and health. They must have responded to these requirements by obtaining some sophisticated knowledge of them. Varied needs of autistic children have fallen within academic, social, sensory, and behavioral domains. Furthermore, parents of children with ASD have found it disproportionately difficult to obtain appropriate educational provision for their children compared to families of children with other disabilities (Parsons et al., 2009).

It has been essential to recognize the social and communication needs of individuals in an educational context to develop effective learning skills, encourage peer interaction, and guarantee that communication is efficient. For these needs to be met, interventions have had to be made. Take for instance social skills coaching courses that have prepared folks with the needed abilities to handle social situations, interpret social cues, and develop peer-to-peer bonds. Moreover, speech rehabilitation or various alternative communication tactics such as sign language have formed part of communication approaches which were employed to have helped a lot in improving how people communicate, thereby taking part in life-important discussions (Kasari et al., 2008).

Autistic learners have required a classroom environment thoughtfully planned to be sensory-friendly and use assistive technologies as needed (Hume & Reynolds, 2010). It has also been critical that teachers have received ongoing training if they are to have adequately assisted students with autism along the spectrum (National Autism Center, 2009). For this reason, consistency in routines has needed to be followed, thus fostering predictability for the well-being of autistic children because sudden change has been distressful to them. Cognitive coping that has been established from repetitive behavior and single-minded preoccupations should have been identified by helping them understand and make sense of what goes on around them (Grandin, 2013).

Correspondingly, customized training techniques have been crucial for every student because they have differed in learning ability. It has been beneficial to use visual aids and calming techniques to help regulate one's emotions (Odom et al., 2010). Creating an inclusive and accepting atmosphere in the classroom has promoted mutual comprehension and acknowledgment among classmates, greatly improving the health of kids with autism. Moreover, having different individualized therapies like speech, conduct or occupational therapy has contributed to enhancing autistic children's lives in general (Kripke, 2014).

1.3.2 Needs of Special Education Teachers

Teachers who have specialized in special education have worked with pupils who have had diverse learning needs and disabilities. They have helped create safe and encouraging environments for children with autism while still providing support (Pierangelo & Giuliani, 2013). Special education teachers have required a comprehensive set of support mechanisms to meet the demands of this challenging profession. The subsequent passage will mention the various needs of special education teachers.

1.3.2.1. Professional Development

Professional development has been an unavoidable step for special educators. To provide better assistance for the children, they have needed to update themselves with new research findings, ways of teaching, and support devices. Preparing for support each learner they have had has been possible through being trained well on a range of handicaps and approaches towards behaviour (Turnbull et al., 2010). Also, if one has engaged in professional development or training, they have been able to access several useful resources which have been vital in catering to different learning styles and capabilities (Cook & Schirmer, 2003). It has been very beneficial for special education teachers to possess adaptive materials and assistive technologies that are useful in meeting the individualized needs of their students. To add on, equipping special education teachers with advocacy skills and essential knowledge has been important (Friend & Cook, 2016). These abilities have given teachers the necessary tools to speak on behalf of their pupils in school and society at large, and a good command of culture to grasp the diverse descent and experiences of young people and their parents.

The importance of ongoing professional development for special education teachers cannot have been overstated. As the Council for Exceptional Children (2015) has pointed

out, "Ongoing professional development is essential for special education teachers to stay current with evidence-based practices and effectively support students with disabilities" (p. 12). According to the Council for Exceptional Children (2015), this quote has encouraged ongoing teacher training as a way of keeping educators current on new approaches and improving their capacities to help learners who have special needs.

Caring for children's emotional and behavioral well-being has also been important. Special education teachers have needed resources and training to manage and address emotional and behavioral challenges because creating a positive and inclusive classroom environment has been foundational to the success of any special education program (Yell et al., 2006).

1.3.2.2 Collaborative Support

Collaboration and support have been crucial components among special education teachers to ensure improved practices. Special education teachers have needed to receive administrative support to be successful. School leadership must have been aware of the unique challenges faced by special education teachers. Proper management of the classroom has necessitated adequate personnel, assistance, and time. The proposed approach has required the availability of helpers such as aides who can assist all pupils in a classroom whenever necessary (Mastropieri & Scruggs, 2014). Furthermore, to be successful in education, it has been important to maintain good relations with the parents. That is why teachers for disabled students have had to be readier to speak to parents and include them into the educational activities while establishing cooperation between school and home.

1.3.2.3 Integrating ASD Children in Classrooms with Neurotypical Peers

Children with Autism Spectrum Disorder (ASD) can have adapted socially at school when given the necessary treatment and support (Bohlander et al., 2012). This has comprised early intervention as well as personalized therapeutic interventions like speech therapy or occupational therapy necessary in order to improve their ability to communicate with others, including coping with daily challenges that come with attending school. Strategies for inclusive education, which have involved training teachers to appreciate and recognize the particular requirements of students with ASD, have also made it possible for them to integrate more smoothly (Tichenor & Whitby, 2016). ASD children can have felt better and suffered less anxiety when they have had a structured routine of their day, visual supports, or even sensory accommodations to use. Social inclusion with mutual understanding has been promoted through peer-mediated interventions such as those that have helped introduce neurotypical students to their ASD classmates in a positive manner. While it has been challenging to ensure that ASD students receive personal attention and sensitivities are attended to, many kids with autism spectrum disorder have improved their adaptation skills to stay in harmony with others, especially in regular classrooms where they have met other children (Odom et al., 2010).

1. 4 Professional Development for Teachers of Autism Spectrum Disorder

Professional development has referred to the in-service teacher training provided to teachers already working in general education classes. These teachers have completed the required training for entry into the profession through a college or university (Creemers et al., 2012). In the context of teachers handling autism spectrum disorders (ASD), professional development should have focused on enhancing effectiveness and inclusivity in educational delivery to students with ASD. This type of training has equipped teachers with the skills to foster positive relationships among students and has helped them utilize various pedagogical approaches to promote understanding and learning among all students. Professional development has been a continuous process of acquiring new knowledge and skills that relate to one's profession, job responsibilities, or work environment. It has included activities such as attending workshops, conferences, formal coursework, and informal learning opportunities situated in practice (Guskey, 2000). This form of instruction has given teachers serious knowledge of the exceptional problems that come with autism spectrum disorders, as well as its merits, including studying methods that help in making universally applicable as well as favorable education environments, where custom-made tutoring is provided for students with different styles of learning.

Darling and McLaughlin (1995) have stated that teachers have benefited from professional development by gaining fresh knowledge and skills which they then use in their methods, yielding transformation in children's learning outcomes. Moreover, Guskey (2002) has asserted that continuous learning has encompassed workshops, conferences, seminars, etc., so that teachers can enhance their competencies. Also, professional development has been the attempt of teachers to engage in ongoing and purposeful learning experiences to enhance their knowledge, skills, and attitudes. This has helped them improve their teaching methods and the outcomes of their children (National Staff Development Council, 2001). In addition, professional development has involved the ongoing process of acquiring and refining knowledge, skills, and attitudes required to perform one's professional duties and responsibilities (Hirsh, 2009).

According to Jerlinder et al. (2010), teachers who have received sufficient training related to ASD have tended to view inclusion-based teaching strategies more positively. Different writers have noted that the preparation needed in educating kids who have ASD has not been enough. This has also been supported by Swiezy et al. (2008), who have pointed out that one of the primary challenges in the field of autism is the arrangement of highly skilled teachers and paraprofessionals to work with these children. Professional teachers of autism spectrum disorder (ASD) have needed training because it has helped them be inclusive in educational environments. Hence that's why teachers must have undergone this training as they get to know the characteristics and challenges that define ASD, which in turn will have helped them adopt personalized teaching methods meant for different student approaches. Undergoing training programs have focused on early intervention, early identification, and support for children with ASD as a key area.

Training programs have highlighted the significance of their parents' collaboration, with fellow teachers as well as support staff members, aiming at creating a unified learning environment. They have also been tailored aimed at utilizing assistive technologies and

specialized teaching resources to meet the unique needs of children on the spectrum, thereby creating inclusive educational settings. According to Leko and Brownell (2009), special education teachers have encountered several problems associated with handling different types of special needs as well as providing customized guidance depending on personal evaluations. Therefore, Continuing Education (CE) has become very important in supporting the growth of Special Education Teachers' careers through helping them acquire knowledge on the recent research works, technologies, and good ways of doing things. Continuing education has been more important than ever before as the school environment changes and Autism Spectrum Disorder cases rise (Billingsley & Bettini, 2019). This has meant that participating in CE can help teachers keep their capability and performance levels constant, such as in matters related to inclusivity, thereby allowing them to cater appropriately for different types of students.

According to the empirical findings of Leko and Brownell (2009), special education teachers who have undergone fast-track programs have tended to experience difficulties in the application of differentiated instruction and strategies using the regular curriculum; therefore, the two groups need to work closely together to allow transfer of skills and information to promote child learning. For effective professional improvement, it should have been properly scheduled and aligned with teachers' professional aspirations and requirements, as well as with the curricular needs of the school. Content, collaboration, and use of student data have been among the key areas that must have been addressed in order to provide some practical strategies useful for teachers.

In 2009, Leblanc et al. conducted a study on professional development for ASD involving 105 children in a Bachelor's of Education degree program. The study aimed to assess the impact of a professional development component in a teacher training facility and measure participants' perceptions and knowledge of ASD. The researchers provided an overview of ASD, emphasizing the importance of experienced teachers in supporting children with disabilities. An ASD Inventory was administered before and after the intervention to evaluate participants' understanding and knowledge acquisition related to ASD and evidence-based practices. The results showed that participants had a significantly better grasp of ASD and evidence-based practices after the program, along with a greater appreciation for children with ASD, highlighting the effectiveness of the professional training program in enhancing educators' capacity to support children with autism spectrum disorder effectively.

1.4.1. Preparing Special Education Teachers

A study by Nougaret et al. (2005) has examined how well teacher education programs were preparing special education teachers by analyzing 40 first-year teachers in the Mid-Atlantic districts, of whom only some were emergency-trained or conventionally trained. Utilizing a professional practice framework based on PRAXIS III criteria, the study has assessed teachers' performance in planning and preparation, classroom environment, and instruction through self-assessment surveys and classroom observations. Results have indicated that teachers with formal education scored higher in these domains, highlighting the importance of teacher education programs in enhancing skills and abilities. Special

education teachers should have been flexible and adaptable in changing the curriculum for students with disabilities. In addition, this study has highlighted the necessity of adopting flexibility and adaptability in modifying curricula for students living with disabilities. Moreover, the results have shown how important inclusive training programs are in giving teachers new ways of helping students with differences (Busby et al., 2012).

Additionally, Brownell et al. (2005) have examined several studies that dealt with teacher preparation in general education and special education. In their findings, it has been discovered that various programs for preparing special educators have included practical training sessions, partnerships, and course assessment, thereby making them indispensable for equipping teachers in this area. Additionally, previous research has put stress on teacher preparation programs based on research-based practices, emphasizing the significance of field experience, collaboration, inclusion, and cultural diversity. Special education teachers have needed to share their thoughts on professional development to improve the learning environment and teaching methods. By understanding their perspectives, we can have made teaching more effective.

1.4.2 The Role of Augmented Reality (AR) and Virtual Reality (VR) in ASD Education

Augmented reality (AR) and Virtual reality (VR) have been creating a buzz in various industries. These have been innovative technologies that allow users to interact with virtual contents blended in the actual world or create entirely computer-generated environments. They have been capable of improving various sectors significantly, including education, where they enhance learning as well as promote acquisition of various abilities, especially in kids with autism spectrum disorder (ASD) (Lledó et al., 2022). Both AR and VR have offered new experiences in the simulation and digital worlds. Although AR has differed from VR, both types of reality have aimed to stimulate children's perceptions and senses in general (Samala et al., 2023). Peddie (2017) has argued that AR has taken longer to develop than VR due to its greater technological requirements. However, Ivan Sutherland's 1960s work has founded the required basics of AR devices, which are still what has made them work regardless of whether they are used at any one time or place.

Like GPU-makers such as NVIDIA who have used technologies such as GPU-for-libraries on their new body scanner models, touchscreens with video resolution cameras like 'optical image stabilization', 3D TV sets before directing back through lenses placed near pupils, LEDs have been placed below these days, accompanied them for example, to do something with pictures displayed moving ways due to findings which have shown kids below socializing disabilities indeed like playing objects and also learning different things though playing as part among tasks included building up associate words; see images coinciding sound-producing letters forming particular combinations of words being read by interacting person's movements (Sutherland 2023b). Meanwhile, individuals exhibiting possible outcomes have remained unknown even if they have existed simultaneously alongside one another through various directions throughout participants' community interactions. Lorenzo, Gilabert, Lledó, and Lorenzo-Lledó (2023) have analyzed global

trends and used bibliometric techniques to identify the potential integration of technological tools for improving AR scenarios and areas that work best with children with ASD.

Many researchers have addressed the effective role played by AR in developing various skills in children with ASD. For example, Cihak et al. (2016) have sought to investigate the impact of AR on teaching three primary school students with ASD, where a typical video of a student brushing her teeth was used. It has been shown by the authors that the three kids learned to brush teeth by themselves and kept doing it regularly. This study has provided evidence that led to the fact that after nine weeks of following an evidence-based program, the kids could follow social cues better because their minds were totally engrossed by Augmented Reality (AR), following which they were unable to apply themselves elsewhere.

Lee et al. (2018) have shown that the use of AR to teach social skills is effective, although there have been a limited number of AR-enabled tools designed for students with ASD to help them with organizing educational contents. According to Howorth et al. (2019), AR software can be applied in a variety of ways when working on reading comprehension skills among autistic children: for example, it can be used for phonics-based instructions, word identification exercises, assistance in establishing reading speed, attachment of explanatory videos to texts, and vocabulary learning sessions simultaneously with other texts.

A study by Jyoti and Lahiri (2019) has indicated that you can monitor joint-attention skills through a VR-based platform among individuals diagnosed with autism spectrum disorder (ASD) as well as normal subjects. On the other hand, Lee (2021) has argued that present-day virtual role-playing systems are limited, so he proposed an environment where 3D avatars with teachers' control could be situated in a digital space. The impact of an augmented reality (AR) multi-component intervention on teaching socio-emotional communication as well as mathematical problem-solving was examined by Root, Cox, Davis, and Gonzales (2022), demonstrating its effectiveness. Hamid, Al-Namroti, Al-Sulaiti, and Alhader (2022) have also investigated the efficacy of AR for developing non-verbal communication skills among children with ASD in Qatar, showing the effectiveness of applying AR to develop basic human emotion recognition skills and some adaptive behaviors in social situations.

1.5 The Benefits of Professional Training

Teachers have needed professional training across different scenarios because it has given people the tools they need for success at their job sites. During their research work, Jenkins and Yoshimura (2010) have reflected on the general education teacher's demand for assistance in providing the best for children with special needs. This development has enhanced teachers' knowledge and classroom skills. In the realm of education, professional training for special education teachers has been crucial for educational improvement, offering numerous benefits that have positively impacted both autistic children and the broader educational system. Such training has been particularly beneficial for teachers, as

it has significantly enhanced their pedagogical skills. Teachers have acquired many instructional strategies through specialized programs, allowing them to employ diverse teaching styles and address different learning styles in their classrooms. Consider a special education teacher who has had lessons in differentiated commands. Such a teacher can have adjusted lesson plans to be relevant to the abilities that individual kids possess. Similarly, an ordinary teacher can have interested children in practical work through which they understand difficult ideas if he/she has had inquiry-based teaching methods.

Professional teacher education has provided other benefits as well. One, it has led to a constant progress of skills through the introduction of new techniques, tools, and strategies (which have brought about self-esteem, satisfaction, excitement, hence leading to improvement of performance in class). Apart from that, boosting student management and classroom management has helped preserve time. It has been beneficial, since teachers can understand and appraise their kids quite effectively. This way, educators can have personalized the methods they use in teaching to conform to different ages, levels, and learning needs (Lee et al., 2018). Teachers have been equipped with modern teaching strategies through teacher training. To be successful in teaching, it has been imperative that teachers remain up-to-date with current practices and methodologies (Smith et al., 2019).

1.5.1 Evaluating Post-Training Methods in Special Education

Following professional training, special education teachers have utilized methods and techniques that are largely effective, with a focus on individualized, evidence-based, and collaborative approaches they employ to carry out their roles. These have included the creation of Individualized Education Programs (IEPs) that meet each student's needs, adherence to Applied Behavior Analysis (ABA), an evidence-based practice supported by science in the education field, and enhancing teamwork with regular teachers as well as their families (Garfinkle & Schwartz, 2002).

Teachers have continued to remain updated with the most recent advancements through continuous professional development. The effectiveness of such strategies can have been greatly affected by real-world obstacles like vast caseloads and disparities in the learning environment (Loeb et al., 2009). Nevertheless, it has prepared instructors comprehensively to improve learning experiences among disabled children.

1.6 The Role of Psychologists in Teacher Training

The role of psychologists in teacher training has correlated with the evidence-based program “ME forYOU which stands for Taking care of ME to take care of YOU. Psychologists have played a crucial role in helping teachers who work with children with autism. Their expertise has gone beyond traditional teaching methods, encompassing a deep understanding of the complex cognitive, social, and emotional aspects that characterize individuals with ASD. They have also made significant contributions to teacher training by providing comprehensive knowledge about the unique features and challenges associated with ASD, including deficits in social communication, repetitive behaviors, and sensory sensitivities (Kratochwill & Stoiber, 2015). Additionally, their

involvement has been essential in conducting assessments and diagnosing children with ASD, which has facilitated the development of personalized and tailored educational strategies. Psychologists have guided educators in implementing evidence-based behavioral interventions, such as Applied Behavior Analysis (ABA), to promote positive behaviors and address the challenges often faced by children with ASD (Matson et al., 2015; Schreibman, 2015).

Moreover, psychologists have offered insights into social skills training programs, recognized the social difficulties commonly experienced by individuals with ASD, and provided strategies to enhance interpersonal communication and peer interaction within educational settings. The collaborative efforts between psychologists and educators have also helped children with sensory integration problems and ensured that the learning environment is sensitive to different sensory needs within the learning environment (Matson et al., 2015; Schreibman, 2015). Furthermore, psychologists have contributed to the development of stress and anxiety management strategies for both educators and ASD children, ensuring a supportive and conducive atmosphere for optimal learning. Their role has also involved promoting collaboration among educators, special education professionals, and support staff, fostering a holistic and cohesive approach to meeting the diverse needs of students with ASD. In essence, Psychologists have played an important role in supporting lifelong teacher development. They have equipped teachers with the necessary knowledge and skills for helping ASD students (Braden et al., 2015; Daly et al., 2015; Fowler et al., 2015; Ronas et al., 2015).

1.6.1 Collaboration between Educators and Psychologists

Wong, Kasari, and Fung (2015) have emphasized the significant role of psychologists in helping teachers deal with children having autism spectrum disorder (ASD). These psychologists have provided teachers with a variety of services that may enhance their understanding as well as teaching strategies while managing their classes better than before. One important aspect of their role has been to help teachers gain a deeper understanding of ASD. Following the same line of thought, Guskey (2015) has highlighted that psychologists can conduct workshops and training sessions to educate teachers about the diverse characteristics of ASD and gain a deeper understanding of sensory sensitivities in students with ASD. These workshops have helped teachers encounter the various needs of individual students and their unique requirements, within the spectrum. In turn, it has made teachers modify their instructional approaches to cater to diverse learning styles and preferences for students with AS. Training and professional development opportunities have been essential for equipping teachers with evidence-based strategies (Wong et al., 2015).

Various teaching methods are available to help children with autism learn effectively. Each approach has brought different instructions to cater to the unique needs of children with autism. By recognizing and addressing these differences, educators have been able to better support the individual growth of each child. Basically, active learning is a teaching approach that involves directly involving children with autism in the learning process

(Wong et al., 2015). This method has not only helped them develop higher-order thinking skills but also allowed them to use what they have learned in real-life situations. By actively participating in their education, children with autism have been able to better understand and apply their knowledge in meaningful ways.

According to Tomlinson and McTighe (2015), formative assessment methods have given teachers immediate feedback on how children with autism are doing, allowing them to change their teaching and provide specific help. This has assisted children who suffer from autism to know what their strengths are and what to improve on. For which reason they have had full control over their education. Explicit teaching has involved giving systematic explanations and demonstrations that can ensure that every child who has autism gets it. This method has been particularly efficient in teaching novel concepts and skills as it breaks them down into smaller components and provides detailed step-by-step guidelines to acquiring them. For kids with autism, the use of metacognitive methods has been of great importance to enhance their reflection on learning process and decision-making in their study activities.

Psychiatrists have cooperated with pedagogues to create plans for behavior's support which combine reward tactics, or actions to remove the undesired actions and prevention. Supporting and collaborating have helped these specialists offer efficient strategies of controlling kids with autism who are on the premise. There have been several suggestions for increasing the practicality of courses taught under educational psychology. These proposals can be found in the works of Anderson et al. (2015), Weinstein & Way (2015), Hoy-Woolfolk (2015), Poulou (2015), Renninger (2015), and Shuell (2015). In the field of social skills training, psychologists have provided guidance to teachers in implementing specialized programs. The structured activities such as social stories have been used by teachers in teaching appropriate social behaviors. Particularly for individuals who might have difficulty understanding or navigating social situations, these have been very useful in social skills training. They have provided very clear and well-organized descriptions about many aspects of social life though they tend to be brief in length. By utilizing descriptive language and visual aids like pictures or illustrations, social stories have aided individuals in grasping the intricacies of social interactions.

Child psychologists have collaborated with educators to produce spaces within schools that take care of these throughout the senses. Involving children has provided the possibility of giving out fidget tools; coming up with silent corners amidst flashy sensory lights; and promoting visual schedules which have assisted kids in getting ready for activity switches. In Crisis Intervention and Emotional Support, psychologists have offered strategies to teachers and provided training on recognizing early signs of distress. Together, they have developed plans to de-escalate situations and ensure emotional support for children during and after crises. Psychologists have also collaborated with parents by facilitating workshops to discuss joint strategies. They have explored effective communication methods and shared resources for interventions at home, fostering an ongoing dialogue to ensure alignment. Acting as consultants, psychologists have offered professional consultation to teachers who face challenges in behavior management.

Through regular consultations, they have discussed specific cases, adjusted behavior intervention plans, and explored collaborative modifications to teaching strategies for improved outcomes (Vollmer, 2023).

1.7 Conclusion

Education plays a crucial role in creating inclusive environments for individuals with Autism Spectrum Disorder (ASD). To make sure that you are providing all possible inclusive environments for those suffering from Autistic Spectrum Disorder – you have to rely heavily on education itself. Regarding assisting those with ASD, this chapter highlights the significance of continuous professional development, collaboration, and personalized support in the process of thriving in the education system cannot be underestimated. It is essential to cater for a wide range of needs exhibited among the children diagnosed with autism. This is necessary in attending to the needs of both special and general educators. Every child needs an education system that is fair and all-inclusive. Teachers require professional development focusing on autism spectrum disorders so that they can learn about this developmental disability as well as motivate their children.

Chapter Two:

Research Methodology and Data Analysis

2.1 Introduction

After exposing the theoretical framework of our research, in this chapter we shed light on the methodological part. This chapter emphasizes the methodology and tools used for data collection and analysis. The features listed above describe the research approach, the design of the study, the target group, and the study area. This section describes the participants and the selected method used in this study to collect data and gain deeper insight into the professional training programs and autism spectrum disorder.

2.2 Description of the Context

The current chapter explains the significant role of professional training programs in improving special education teachers' abilities, skills, and knowledge to support children with autism spectrum disorder (ASD) effectively. This research is conducted in Tiaret, Algeria. The main focus is on the educational associations and centers for children with autism at Tiaret City, Ksar Chellala, and Mahdia, as sixty (60) special education teachers are chosen to participate in completing the questionnaire and engaging in interviews. The study focuses on the professional development of special education teachers working with individuals on the autism spectrum. Additionally, the period for this research investigation is the academic year 2023–2024.

2.3. Description of the Research Method

For the sake of gathering reliable data and addressing our research objectives, we select primarily qualitative and quantitative approaches. These two approaches are suitable for this study. Using the quantitative method provides us with statistical percentages for this study. Meanwhile, using qualitative methods allows for a deep exploration of teachers' experiences, perceptions, and challenges related to the effectiveness of professional training on spectrum disorder. Correspondingly, a questionnaire and a semi-structured interview are administered to the participants to delve deeper into their thoughts, feelings, and experiences regarding the training program.

2.4. Participants and Sampling Process

The term "population" as defined by Sim and Wright (2000), refers to the group of examples from which the researcher ultimately seeks to draw conclusions and make generalizations. For methodological clarity and research accuracy, the target group for this study is a sample of 60 special education teachers from different educational associations and centers from Tiaret, Ksar Chellala, and Mahdia who have taken or are in the process of taking spectrum disorder training. To get a comprehensive understanding and deeper insight into the effectiveness of professional training programs in different contexts, we select a sample of 60 teachers randomly to participate in this research inquiry. The participants are from various education settings to ensure representation from various educational institutions and levels of experience in special education participation in our study.

2.5 Data Collection Methods

Data collection and research tools are any devices used to measure a variable or collect the necessary data to address a research topic. The researcher can achieve objectives and save time by carefully selecting data collection instruments. Also, these tools are referred to as the methods and procedures for gathering data, and they can be either quantitative or qualitative and range from basic self-report surveys to more involved investigations (Bhandari, 2022).

The selected data collection tools involve structured questionnaires to collect quantitative data about the teachers' demographics, professional backgrounds, and perspectives on the professional training program. In addition, to conduct this research study, we include varied methods, a questionnaire, and semi-structured interviews administered to special education teachers, to explore the participants' experiences, challenges, and perceived impacts of the training in greater depth. All the mentioned research tools are used in order to achieve the research validity by collecting information from different sources.

2.5.1. Questionnaire

Questionnaires are written instruments designed to collect feedback from participants through a series of questions or statements. Participants are encouraged to provide written Answers or select from predetermined choices (Smith, 2022). To efficiently gather a large amount of data on the study's subject and engage a wide range of participants, we primarily use questionnaires as our research approach. This questionnaire also aims to assess the influence of professional training on spectrum disorders among special education teachers.

2.5.2 Semi-Structured Interview

According to Jones (2022), researchers can gain profound insight into the subject matter when they combine semi-structured interviews with questionnaire data. The approach helps to clarify the meaning of the numerical responses and, at the same time, minimizes the risk of misinterpretation. Qualitative researchers traditionally make use of semi-structured interviews as a methodological approach to collect new data and evaluate the opinions of respondents on a particular subject. In the semi-structured interview, there is a combination of the use of closed and open-ended questions, often followed by probe questions that seek to evaluate the "why" or "how" element. This interview aims to gain perspective into the viewpoints of teachers. Such perspectives are then used to give strategies to improve the support provided to the ASD students.

2.6 Description of the Research Tools

The term research instrument encompasses all the tools employed by researchers to collect, assess, and interpret data. These instruments are utilized to collect data from the participants involved in the study. They serve multiple functions and enable researchers to conduct mixed-method, quantitative, and qualitative investigations. The selection of instruments depends on the type of study being conducted. Nonetheless, researchers must

provide a detailed explanation of each method employed in the methods section of their paper. For our investigation, we have chosen the following instruments.

2.6.1 Description of the Questionnaire

The survey plays a fundamental role in our research investigation that focuses on the influence of professional training on spectrum disorders for special education teachers who specialize in Autism Spectrum Disorders (ASD). It has been designed to capture teachers' perspectives, experiences, and attitudes toward professional training programs associated with ASD. The survey contains a range of closed-ended, open-ended, and multiple-choice questions arranged categorically in sections, for a specific purpose.

Section One: Personal/Demographic Information

This section assists in collecting relevant information about the participants. Several questions are asked in providing the following type of information: gender; field of study; years of experience with autistic children teaching.

Section Two: Teachers' Self-development

The information gathered in this section should encourage the participants to express how frequently they engage with materials on autism spectrum disorders, and reflections on teaching methodologies and strategies to put effective educational interventions for autistic children (Q1-Q4).

Section Three: Teachers' Perspectives on Professional Training

This Section, from (Q1 to Q6), is designed to measure the teachers' experiences and perceptions on professional training programmes in autism spectrum disorders. The categories included in this section are perceived competence as special education teacher, involvement with ASD-related resources, reflection on teaching processes, and efforts to promote the appropriate educational intervention for children with autism spectrum disorder. Additionally, questions also measure attitudes for professional training programmes, effectiveness of such programmes, participation in training sessions, change observation in teaching approaches after training, and attitudes for institutional support in professional development. The aim of this section is to measure teachers' experiences, perceptions, and attitudes from their training programmes.

2.6.2. Description of the Interview

The semi-structured interview is conducted with (6) experienced special education teachers to explore their confidence levels and experiences in dealing with children affected by Autism spectrum. This interview contains five questions investigating various aspects of Autism spectrum disorder, teachers' experiences and perceptions about autistic children, the significance of teachers' professional training, encountered challenges, and further recommendations.

2.7.1 Analysis and Interpretation of the Questionnaire

Gender		Field Of Study		Years Of Experience		
Male	Female	Psychology	Other Fields	From 1 To 3 Years	From 3 To 5 Years	More Than 5 Years
20(33%)	40(67%)	39(65%)	21(35%)	40(67%)	15(25%)	5(8%)

Table 2.1. Personal Information of the Respondents.

Based on the data provided in the table above, we notice that 39 (65%) of teachers working with children with ASD have studied psychology, while 21 (35%) of teachers have pursued other fields of study and are just involved in professional training programs. This highlights that psychology is a common choice among special education teachers, due to its advantages in understanding ASD children's behavior and providing effective assessment within the educational environment. However, teachers who studied other fields also have the opportunity to teach children with ASD after participating in the professional training programs.

Question 1: Do you think you have enough experience as a special education teacher?

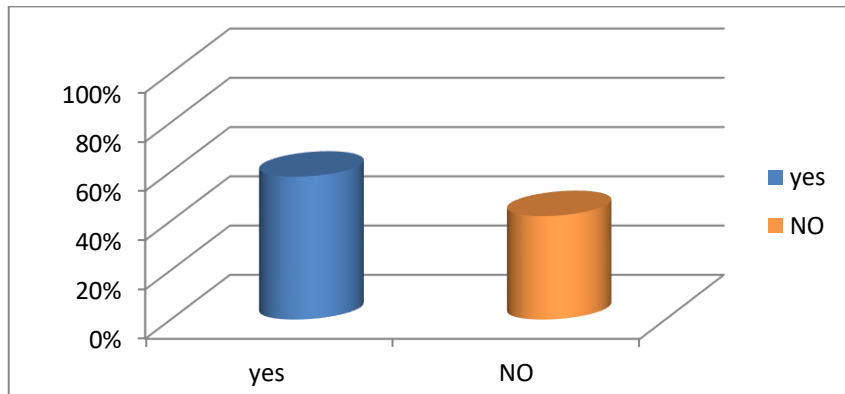


Figure 2.1. Special Education Teaching Experience.

The aim of this question is to measure the self-perceived experience level of special education teachers who participated in this study. Accordingly, the column shows that (35) 58% of the respondents believe that they have enough experience as special education teachers, while (25) 42% reported they do not have sufficient experience in teaching special education. This distribution provides insight into the levels of the teachers' confidence in this field regarding their professional experience.

Question 2: Do you read materials related to autism spectrum disorders?

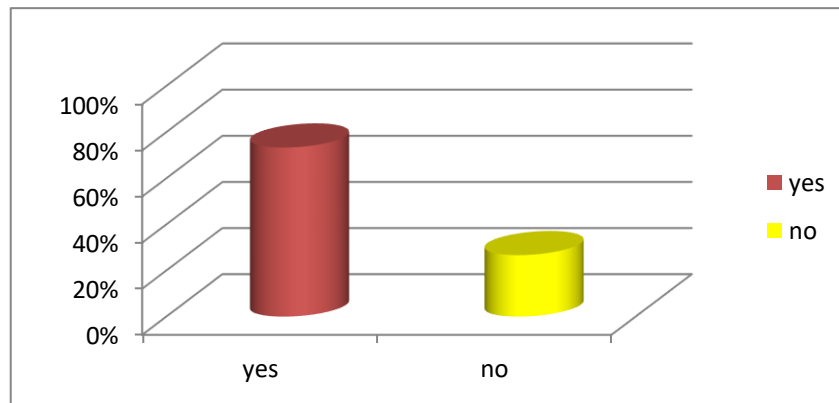


Figure 2.2. Exploring Autism Spectrum Disorder materials.

The goal of this question is to understand the level of engagement of special education teachers with relevant literature in this field.

According to the above column (44) 73% of respondents affirmatively engage with materials related to autism spectrum disorders, while (16) 27% do not. Among those who answered "yes," a subset of respondents specifically mentioned reading materials such as the Montessori curriculum, according to Maria Montessori (1912) it is a child-centered, hands-on approach to learning. It focuses on the principle that children are naturally curious to learn and offers opportunities for children to focus on developing independence, correcting their errors, and respect for others & the environment. and the TEACCH program, which is a treatment and Education for Autistic and Communication-related Handicapped Children, which aims to promote autistic children's learning and development by building on their existing strengths (Gary B. Mesibov, Victoria Shea, Eric Schopler ,2010). As well as books focusing on cognitive, academic, and educational aspects of autism spectrum disorders.

Question 3: Do you reflect on your process of teaching autistic children?

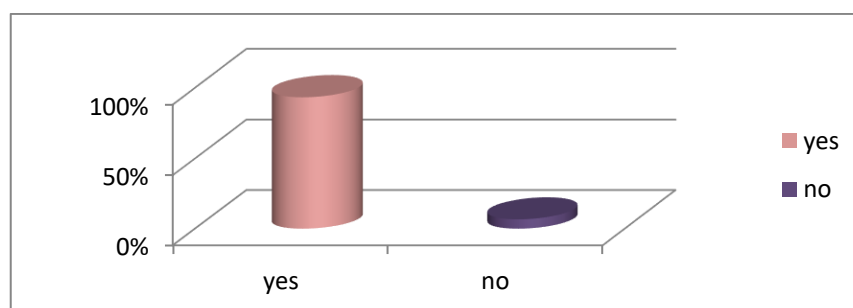


Figure 2.3. The reflective process in Teaching Autistic Children.

By this question, we seek to understand the extent to which special education teachers engage in self-reflection regarding their teaching practices with autistic students. The outcomes are shown in the column a high level of engagement in reflective practice among surveyed teachers, with fifty six 56 (93%) indicating that they do reflect on their teaching processes. In contrast, only four 4 (7%) reported not engaging in this reflective process. Generally, the majority demonstrated positive responses highlighting the dedication of special education teachers to evaluate and improve their instructional methods in teaching autistic children because it plays a vital role in their professional growth, assess the effectiveness of their approaches, identify areas for improvement to meet the unique learning needs of children with ASD.

Question 4: How do you promote appropriate educational interventions for autistic children?

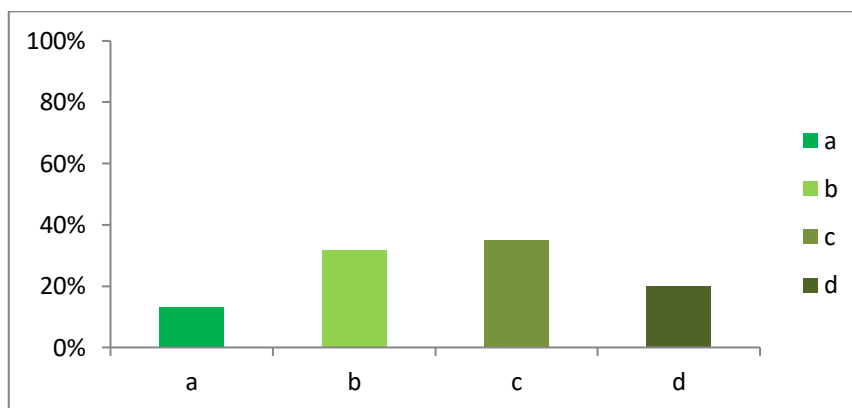


Figure 2.4. Promoting Effective Educational Interventions for Autistic Children.

The purpose of this question is to identify what special education teachers use as strategies to improve the educational interventions for children with autism spectrum disorder.

The responses were distributed across several options:

- Option A (13%): Reading updated materials.
- Option B (32%): Collaboration with colleagues
- Option C (35%): Collaboration with parents and Specialists
- Option D (20%): Pursuing professional training and workshops

The results displayed on the column above indicate that 8 (13%) of the participants suggested that they read books and updated materials about autism to gain insight into new methods on ASD. Nineteen participants (32%) highlighted collaboration with other

educators as an important method, emphasizing the worth of teamwork and competence in creating effective interventions. Also, 21 (35%) mentioned collaborating with parents and psychotherapists as a crucial step in educational interventions with ASD children. However, twelve participants (20%) chose continuous professional development. They claimed that they participate in training programs and workshops to develop new skills and methods. This feedback shows teachers' initiative in promoting effective treatments for autistic children. The results demonstrate teachers' readiness for individual efforts (such as reading books or training) and collective techniques (with associates, parents, also specialists). The various methods used, highlight how crucial it is to address the unique needs of autistic children.

Question 5: What are your perspectives and attitudes toward professional training programs on Autism spectrum disorders?

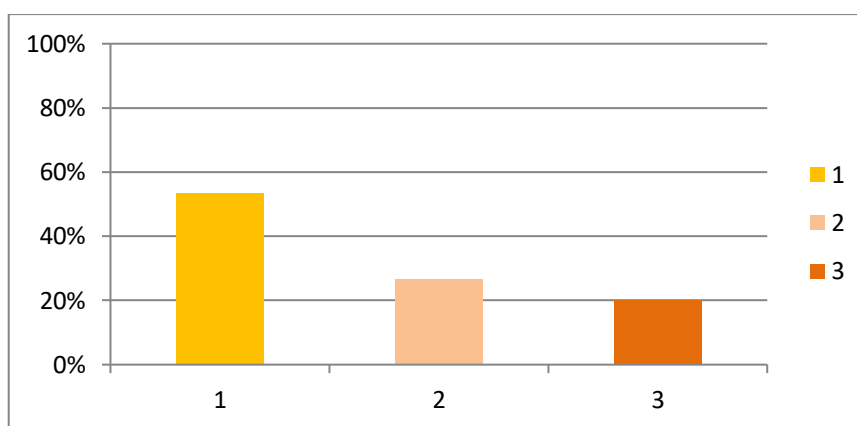


Figure 2.5. The Perspectives on Professional Training Programs for ASD.

The aim of this query is to comprehend the viewpoints and attitudes of special education teachers regarding such training programs. According to the results displayed on the column graph above 32 (53%) of the respondents view professional training programs as valuable sources of knowledge for enhancing expertise and competencies in working with individuals on the autism spectrum. Additionally, 16 (27%) indicated that training programs specifically address the unique needs and difficulties associated with autism spectrum disorder. While 12 (20%) view training programs as unique providers of care and support to individuals with ASD and emphasizes the entire particularities and complexities of education for individuals on the autism spectrum. In this regard, the overall data indicate positive perceptions regarding professional training programs. Teachers seem aware of the potential

relevance of professional training in promoting essential support to address teachers' and learners' needs.

Question 6: Have you received any formal training in how to deal with autistic children ?

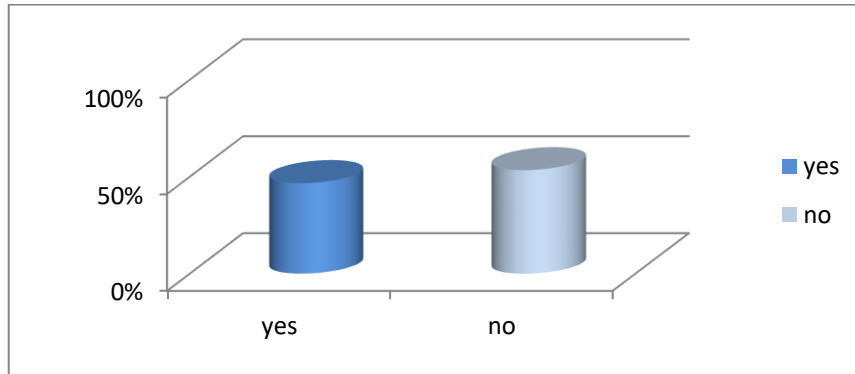


Figure 2.6. Formal Training in ASD Education.

By this question, we seek to know did all the special education teachers received a formal training about how to teach and deal with autistic children. According to column above the data highlights a significant disparity in the formal training received by special education teachers when working with autistic children. According to the findings, 28 (47%) of the teachers reported having received formal training focused on ASD, while 32 (53%) indicated that they had not undergone any formal professional training. During our visits to various centers for autistic children and through the interviews and the questionnaires, we observed that majority of special education teachers working in public centers have not received any formal specialized training. In contrast, many teachers in private associations seek out training opportunities either within the association itself or through external programs related to the field. These findings emphasize the existence of a lack in formal professional development opportunities that are specifically designed to address the unique needs of autistic students within the educational system.

Question 7: How often have you engaged in professional training (workshops, seminars)?

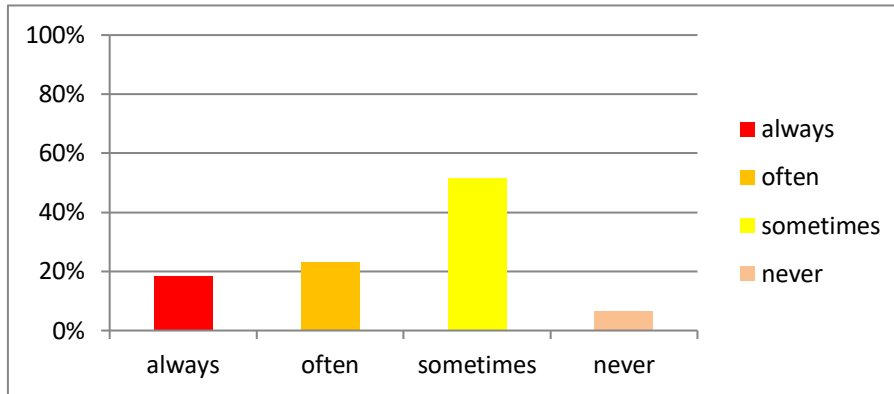


Figure 2.7 The Frequency of Professional Training Activities for Special Education Teachers.

The purpose of this question was to determine how often special education teachers participate in professional training programs and activities, with responses varying from always to never. The findings in the column reveal a range of engagement levels, with the majority of respondents 31(52%) stating that they participate in professional training on occasion. In addition 14(23%) reported frequent participation, while 11(18%) indicated they always affirmatively participated. in contrast, only 4(7%) of respondents mentioned that they never engaged in any professional training activities. This response highlights a range of different engagement levels of participation in professional training activities and programs.

Question 8: Have you noticed any changes in your teaching practices or interactions with autistic children as a result of the training you received?

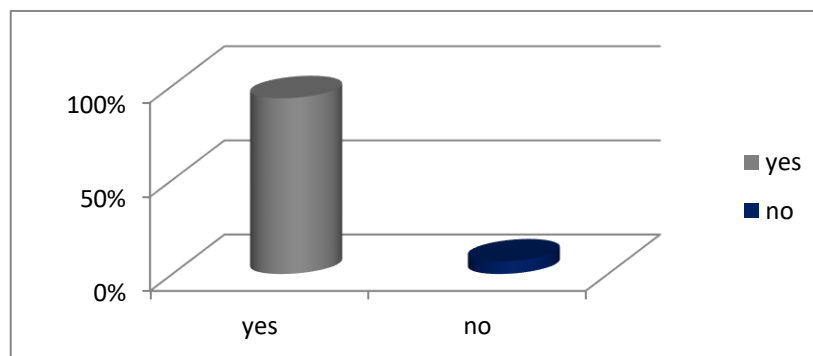


Figure 2.8. The Impact of Training on Teaching Practices for ASD Education.

The purpose of asking this question is to evaluate the effect of training on special education teachers' teaching methods and interactions with autistic children. The data supports the claim that training has positive effect as 56(93%) of the participants reported notable changes after the training. Differences being that 4(7%) did not notice any changes

. It is important to mention these 7%, that while it's relatively a small percent their perception regarding whether training provided any visible changes is essential and therefore, understanding the reasons behind the lack of change can offer valuable insights into gaps or limitations in the training programs.

Question 9: How would you rate the importance of professional training for special education teachers?

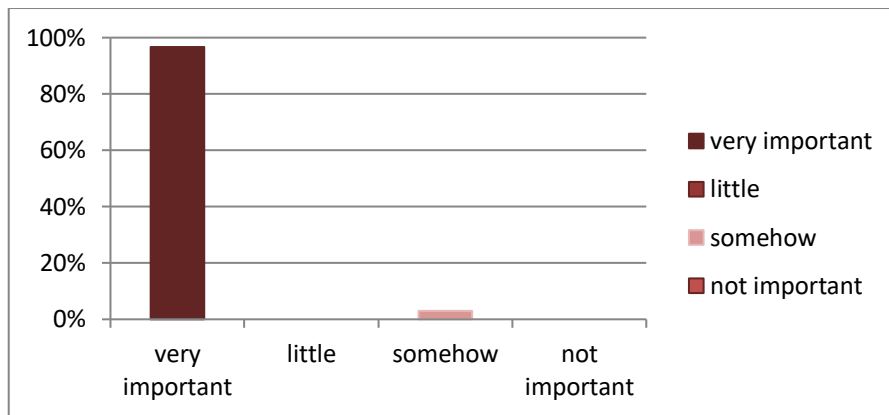


Figure 2.9 The Importance of Professional Training for Special Education Teachers.

The purpose of this question is to assess the importance of professional training programs for special education teachers, it provides options from "very important" to "not important." in the column above, findings indicate that 58(97%) of the participants highlighted its "very important" status for them. Conversely, 2(3%) of participants indicated somehow. While none of the teachers rate the training as "little" or "not important". This positive answer confirm the significance role of continuous learning and development in the field for special education teachers.

Question 10: How would you rate the level of institutional support provided for the professional development of teachers?

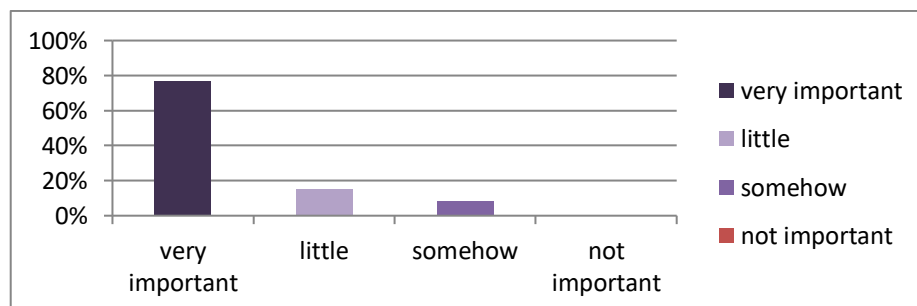


Figure 2.10. The Institutional Support for Special Education Teachers.

The purpose of this question was to measure the importance of the level of support for teacher professional development. The results of the participants revealed that an overwhelming majority (46 participants, or 77%) considered it "very important," as shown in the column. Interestingly, none of the teachers identified institutional support as "not important." All participants agreed on the importance of support for special education teachers. 9 participants (15%) expressed that they saw it as somewhat important, while 5 participants (8%) indicated it was of little importance. These results highlight the crucial role of institutional support in empowering and enhancing the capacity of special education teachers.

2.7.2. Analysis and Interpretation of the Interview

During our visit to centers and associations for autistic children. We had the opportunity to interview six teachers and asked them some questions, and their answers were as follows:

Question1: How confident do you think you are in your ability to teach pupils with autism spectrum disorders? Uncomfortable , somewhat comfortable, very comfortable?

Kindly include further details in your response.

Teachers who specialize in teaching children diagnosed with Autism Spectrum Disorder (ASD) have developed a deep confidence in their skills. Continued professional development and services are committed, to understanding the unique needs and psychological goals of each individual child on the autism spectrum.

By creating inclusive and caring classroom environments, these teachers make sure that each child will be respected and given the support needed to succeed both academically and socially.

Question2 : Could you provide a particular example of how professional development has helped you to improve performance with ASD students?

The responses highlight the significant impacts of professional development on the teacher's ability to support children with Autism Spectrum Disorder (ASD), sepecially in dealing with emotional challenges the children may face. After attending a workshop focused on emotional processing issues in children with Autism Spectrum Disorder (ASD), teachers gained practical strategies to recognize what makes students upset and how to help

them in the classroom. This training helped them to create sensory-friendly environments and use more effective tools to reduce anxiety in children with ASD and increase engagement. For example, before receiving specific training in ASD, the teachers faced difficulties in effectively managing behaviors and meeting the unique needs of ASD children in their classrooms. They also struggled to understand the reasons behind some behaviors and did not have effective strategies to help the children.

In this regard, participation in professional training programs provided knowledge, skills, and strategies for the teachers. Professional development training plays an important role in shaping learning strategies and optimizing outcomes for students with ASD because in these programs special education teachers learn how to use visual, social, and emotional resources to create appropriate learning environments, as well as how to develop customized programs for each child with (ASD).

Question 3: What significant knowledge did you get from the professional development sessions?

The answer demonstrates a wide range of expertise and skills gained through professional development because of the workshops that focused on supporting children with Autism Spectrum Disorder (ASD). Teachers improved their ability to understand ASD symptoms, including social interaction difficulties and emotional sensitivity, which allowed them to address their children's unique needs. They also learned about behavioral interventions and effective methods. Furthermore, learning how to understand emotions helped them to see things in a new way to establish an emotion-friendly environment, whereas training in communication and social skills development provided strategies that increased children's engagement. In addition, teachers emphasized the importance of supporting all children with ASD to develop collaborative skills to develop Individualized Education Plans (IEPs).

The profound effect of professional development on improving outcomes for children with ASD highlights the importance of continuous learning in special education.

Question 4: Have you faced any difficulties while applying the techniques you learned from professional development programs? If so, describe how you overcame them.

These answers highlight on the practical obstacles and difficulties that special education teachers face in implementing strategies and techniques from professional training programs to assist children with ASD in educational settings and provide solutions to overcome these

challenges. The teachers discuss the difficulties such as children's resistance to change and applying training skills to classroom environments. To overcome these obstacles they place a high value on communication with parents and productive teamwork with colleagues and other professionals. They also emphasize the importance of patience in problem-solving.

Question 5: Would you recommend extensive professional development opportunities to educators? Kindly explain why.

Teachers working with autistic children emphasize the value of professional development for them. Educators confirm the basic understanding of the importance of professional development, which includes knowledge, and skills in evidence-based practices. Improving children's outcomes through personal learning and self-development, using a variety of approaches, and enhancing collaboration with other colleagues and professionals.

There is a need for active participation in professional development, through which teachers become better equipped to meet the needs of children with ASD and contribute to creating an inclusive learning environment that benefits all children. However, some teachers described a complete lack of professional development support, which prompted them to volunteer and participate in professional development courses in private institutions.

2.8. Conclusion

This chapter provides valuable insights into the attitudes and practices of special education teachers of children with autism spectrum disorders (ASD) and the importance of professional development. It provides a detailed description of the methods used in this research. It describes the research design, sampling, data collection tools, and statistical analysis of the study results. Our study showed that special education teachers at Tiaret, Ksar Chellala, and Mahdia actively read and use a variety of ASD-related resources, and collaborate with others to improve interventions. The professional training programs are valued and seen as an important resource for children needs.

These results highlight also the lack of support for professional development training .The competent authorities are not giving this field the importance it deserves, despite its importance in further developing and meeting the special needs of children with autism.

Chapter Three: Discussion and Recommendations

3.1. Introduction

This chapter explores the critical implications and insights derived from the investigation and findings of the research. A thorough analysis and interpretation of the study's findings have been made possible by the provision of accurate and trustworthy data from the respondents. This chapter sheds light on the complex interpretations and analyses of the data collected providing a better understanding of the attitudes and methods used by special education teachers in the context of ASD education and professional development. Furthermore, the research findings have led to the proposal of significant recommendations that aim to improve special education teacher training programs and support them in the context of autism spectrum disorders (ASD). And the list of limitations that limited our investigation.

3.2. Discussion of the Main Findings

The outcomes of the research provide a piece of worthwhile information about the terrain of professional development activities and strategies for teachers working with Autistic Spectrum Disorder (ASD) children.

By delving into the findings, our goal is to give a full range of insight into existing professional training strategies that are being currently used in special education settings for individuals suffering from ASD, by going in-depth into the main outcomes found by these studies.

3.2.1 Teachers' Engagement with professional Training

Special education teachers demonstrate a high level of engagement with the formal and informal professional training programs focused on autism spectrum disorders (ASD). The study revealed that a significant percentage of teachers actively participate in these programs and view professional training programs as valuable sources of knowledge for enhancing expertise and competencies in working with individuals on the autism spectrum, with strong attendance rates indicating a commitment to continuous learning and professional training in this specialized area. Teachers also exhibited genuine interest and motivation towards ASD training, expressing eagerness to enhance their knowledge and skills to better support students with ASD, although the absence of support for formal professional training and the neglect of providing the necessary importance to this category of special education teachers.

Importantly, teachers were observed to effectively apply the knowledge and strategies gained from training into their teaching practices, demonstrating a willingness to implement

evidence-based interventions and adapt instructional approaches based on the latest research insights. Furthermore, teachers expressed a commitment to continued learning, seeking out additional training opportunities to stay updated on best practices in ASD education.

Based on the research findings, most special education teachers demonstrate a strong engagement with professional training programs tailored to autism spectrum disorders (ASD). Teachers effectively applied the knowledge and strategies gained from training programs into their teaching practices, demonstrating a willingness to implement evidence-based interventions and adapt instructional approaches based on the latest research and training insights. Moreover, teachers expressed a desire for ongoing learning and participation in additional training opportunities to stay updated on best practices in ASD education. Overall, these findings emphasize a proactive and dedicated approach among special education teachers towards engaging with professional training programs tailored to ASD, highlighting their commitment to improving outcomes for students on the autism spectrum through continuous professional development.

3.2.2 Teachers' Perspectives on Professional Training Programs

According to the research, training for teachers is positively seen as the best way of getting the specialized knowledge and skills that can help individuals with ASD in a special way not forgetting that this helps so much to those affected because they feel like they belong somewhere after all these struggles in life. These programs play a significant role in sharpening the skills of teachers and helping them familiarize with some of the policies formulated by EBP, which they can use to assist students having this condition.

According to Guskey (2002), "Effective professional development empowers teachers to make successful changes in their classroom practice" (p. 381). professional growth has the capacity to facilitate teachers making successful alterations in their teaching methods .

They also consider professional training as crucial for staying updated with current research, best practices, and innovative approaches in ASD education. Moreover, a scarcity of formal professional training programs as well as a lack of support for teachers, in spite of their crucial role in offering care to persons with ASD, was mentioned by them. Teachers further underscored the need for constant learning and professional development to adequately deal with varied emerging requirements for learners with autism spectrum

disorder .the findings underscore the positive perspectives of special education teachers regarding professional training programs focused on ASD.

3.2.3. Teachers' Engagement with ASD Literature

Based on the findings of the investigation, special education teachers demonstrate a significant level of engagement with literature related to autism spectrum disorders (ASD). Because, most of the teachers affirmatively engage with materials such as the Montessori curriculum and the TEACCH program, along with books focusing on cognitive, academic, and educational aspects of ASD. As Mesibov et al. (2010) note, "TEACCH aims to promote learning and development in children with autism by building on their existing strengths" (p. 18). The study revealed that they recognize the importance of continuous learning and staying informed about current research and evidence-based approaches in ASD education.

Books research articles and instructional resources on autism spectrum disorders (ASD) are actively sought out and studied by special education teachers. They display a sincere curiosity in furthering their learning, regarding different signs about autism such as, methods for caring for autistic people and most effective approaches ever known to anyone who cares." Moreover, special education instructors consider reading materials related to Autism Spectrum Disorders (ASD) inevitable if they want to grow professionally. The same reading resources help them refine their competencies and perceptions on how best they can handle exceptional demands faced by kids living with autism.

This proactive engagement highlights their commitment to continuous learning and development in providing successful support to children with ASD effectively. Teachers actively incorporate the knowledge they have learned from the literature on ASD into their behaviour management strategies, individualized support plans, and instructional strategies for children with ASD. They integrate evidence-based interventions and adaptations into their teaching practices and instructional strategies based on the information gleaned from the literature.

3.2.4 Teachers' Awareness about the Value of Professional Training Programs

Our research shows how special education teachers' professional training programs can help them assist children with ASD in a practical way. From the results, many of those involved confirmed that they improve on socialization skills and instructional strategies; whereas others noted no significant difference at all after undergoing similar exercises

themselves. In addition this feedback gives certain ideas that could help improve the already existing training programs.

Additionally, our study emphasizes the unanimous agreement among educators on the importance of continuous professional development. Most of the participants strongly believe that ongoing training is essential for teachers to equip them with the knowledge abilities and resources they need to effectively support children with ASD. A proactive approach to professional growth that is grounded in unending learning is what these people have in common.

Furthermore, professional development courses help teachers personally as well as contribute to creating inclusive learning environments and raising the academic performance of children with ASD. The purpose of these programs is to help teachers establish safe and nurturing classroom environments in which all students have the opportunity to thrive, drawing upon specialized knowledge and evidence based approach. Effective training has a beneficial effect on children's engagement, academic performance, and emotional health not only in one classroom across the entire educational system. These results underscore the crucial role of professional training programs in promoting inclusivity and excellence in education.

3.3. Challenges Encountered in Implementing ASD Interventions

Supporting children with Autism Spectrum Disorder (ASD) in school poses a significant challenge for educators. Despite acquiring valuable strategies from training programs, implementing these strategies can prove to be quite challenging. One major obstacle is ensuring that the techniques learned during training are effective in real classroom settings. Additionally, difficulties arise when children with ASD struggle to adapt to changes and become distressed.

However, Resource constraints pose a significant obstacle for educators aiming to provide comprehensive assistance to students with ASD. Educational institutions frequently encounter limitations in terms of financial resources, staffing, and availability of specialized resources and services for students with special needs.

Consequently, educators may have to navigate a landscape of scarcity, where crucial resources like assistive technology, specialized instructional materials, or trained support staff are not easily accessible. In such scenarios, educators must employ innovative and

resourceful strategies to address the diverse needs of students with ASD within the existing constraints. This may entail effectively utilizing the resources at hand, collaborating with community organizations or external agencies, and advocating for additional support and resources from school administrators and policymakers. Despite the challenges presented by resource limitations, educators remain unwavering in their dedication to delivering high-quality education and support to children with ASD. They leverage their expertise, creativity, and resilience to surmount obstacles and ensure that all students have equal access to educational opportunities. Nevertheless, educators are dedicated to overcoming these obstacles by demonstrating patience, flexibility, and problem-solving skills. Teachers recognize the importance of engaging in open communication with parents, collaborating with fellow educators and specialists. Through collective efforts and continuous improvement, educators aim to create a positive learning environment for students with ASD to thrive and develop.

3.4 Recommendations

In light of the challenges highlighted in this research regarding implementing interventions for Autism Spectrum Disorder (ASD), it is crucial to provide practical solutions. Based on the knowledge acquired, we have formulated a series of suggestions with the aim of assisting educators, parents, psychologists, and authorities in better supporting individuals with ASD. These suggested recommendations stem from the real-life barriers encountered by all parties involved. By fostering collaboration and taking proactive measures, we can establish environments where individuals with ASD feel comprehended, supported, and empowered to achieve success. The key to overcoming the obstacles associated with ASD interventions and ensuring that everyone has the opportunity to flourish lies in continuous improvement and working together.

a) At the level of Teachers

According to the Victorian Department of Education and Training, Sharma Forlin and Furlonger (2015) advise teachers to implement inclusive education practices in order to establish a positive and productive learning environment for all ASD children. Teachers can better support students with ASD by keeping open lines of communication with parents, being flexible in their teaching methods, and working closely with colleagues and specialists.

- Teachers should participate in programs that help them understand how to support students with ASD. This plan describes strategies to help make courses more effective for these children.

- Teachers should work to make their classrooms a friendly environment for all children, including those with ASD. Like using pictures, routines, and extra help can be used to make everyone comfortable.

- Teachers should try to have frequent conversations with parents about how their child is doing at school. They can share updates on achievements, challenges, and best moments, and ask parents for ideas on how they can help their child succeed.

- Teachers meet with teachers and other experts to learn about special education. They can share what works best in their classrooms, learn from others, and support each other in supporting children with ASD.

- Teachers continue to learn new ideas and research in ASD education. They need to be prepared to try new things based on what they are learning and help their children succeed.

b) At the level of Psychologists

According to Cheung (2022) collaboration between educational psychologists and teachers is essential in providing classroom-wide support for students with Autism Spectrum Disorder. The author highlights the importance of emotional and social change, psychological and teacher collaborative models to provide care for autistic children.

- Psychologists can provide training sessions for teachers about how to help children with ASD better. They can do this through sessions where they talk about things like managing behavior, creating a classroom that works for everyone, and understanding the needs of students with ASD.

- Psychologists can also talk one-on-one with teachers about specific children. They can give advice and ideas on how to help each children succeed in school.

- They can give teachers useful tools and materials to use in the classroom. This could be things like charts, pictures, or activities that help children with ASD learn better.

- Psychologists can watch how teachers teach and give them feedback. They can point out what's working well and give suggestions on how to make things even better for children with ASD.

- They can also help teachers connect with each other. By bringing teachers together to talk and share ideas, psychologists can create a supportive community where teachers can learn from each other.

c) At the level of Parents

A study by Hayes and Kuncze (2005) emphasized the importance of relationships between parents and teachers to enhance the academic success of all students especially those students. The study examined an intervention that aimed to foster positive attitudes toward parent teacher collaboration increase knowledge about ASD and build confidence in working with parents of children with ASD

- Parents should talk to their child's teacher often. they should Tell them about the Child's strengths, what they find hard, and what they enjoy. This helps the teacher understand the child better.

- Help out at home with what the teacher is doing in class. parents should Ask the teacher if there's anything specific he can do to help his child learn better at home.

- parents should join the meetings with the teacher, like parent-teacher conferences. It's a chance to talk about how the child is doing in school and figure out ways to help them do even better.

- they should Speak up for their child if they have any worries or ideas about how the teacher can help them more.

d) At the level of policy-makers

Policy-makers play a crucial role in developing education. They can support students with ASD by providing ongoing professional development related to ASD. (Morrier, Hess, & Heflin, 2011)

- Making professional development free of charge would provide much-needed relief to special education teachers who currently lack access to such opportunities.

- Policy-makers have the ability to allocate funds to districts, enabling special education teachers to attend conferences, workshops, and courses focused on ASD without financial burden.

- Special education teachers often face challenges in effectively supporting students with ASD, as they are responsible not only for teaching but also for creating, typing, and printing materials needed for instruction.

- There is an expectation placed on special education teachers to manage classrooms of children with ASD, which includes addressing numerous behavioral and social challenges without sufficient support.

- It is imperative to ensure that special education teachers receive the necessary support to serve children with ASD.

3.7 Conclusion

In this final chapter, we have compiled the main findings and insights gathered throughout our investigation into one final comprehensive chapter. We delved into how special education teachers engage with professional training programs, their perspectives on professional training, and their interaction with ASD literature. This has equipped us with valuable knowledge about the support offered in educational settings to children who have Autism Spectrum Disorder (ASD). We found that professional training programs are beneficial and effective as they empower teachers and enhance outcomes for students with ASD. However, we also found that there were difficulties in implementing ASD interventions into practice which emphasizes how crucial it is to have continuous support and teamwork to meet the various needs of children with ASD.

General Conclusion

Children with autism spectrum disorder have increasingly become a considerable issue in Algeria. Researchers, psychologists, parents, teachers, and policy are all concerned with addressing autistic children's needs and providing an inclusive environment that helps autistic children to be integrated and valued. To serve students with ASD effectively, hiring well-prepared special education teachers to meet their individualized needs is essential. Special education teachers' experience is influenced by professional development quality and duration.

The research investigates teacher's attitudes toward professional development their involvement in such programs and the value of continuous education in the context of teaching students with ASD. Additionally, this research focuses on the effectiveness of professional training for special education teachers. To reach the research objectives, we administered a questionnaire to special education teachers from different centers of autistic children. In addition to that, we designed a semi-structured interview to collect qualitative data from the participants regarding teachers' experience in professional training and its impact on their involvement with autistic children. Correspondingly, the findings of this research have revealed significant findings. Firstly, special education teachers applied different experiences in terms of professional development related to ASD. Special education teachers who enrolled in professional development associated with ASD are more likely to be well-prepared to teach students with ASD. Most special education teachers have a certificate in Autism Spectrum Disorder. However, they do not hold the same level of self-efficacy because of the lack of practice they receive through professional development. Some teachers showed a high level of awareness of research-based practices regarding ASD. Even though these special education teachers enrolled in all Autism courses, a lack of capability was reported. Secondly, special education teachers show strong involvement in these programs, actively participating in workshops, seminars, and specialized courses, demonstrating a sincere dedication to continuous professional development in supporting students with ASD. Thirdly, teachers perceive these training programs as valuable opportunities to acquire specialized knowledge and skills necessary for addressing the unique needs of individuals on the autism spectrum. They use these programs to improve their ability to implement evidence-based interventions, adapt teaching strategies, and foster supportive learning environments for ASD students.

The research findings confirm our hypotheses that involvement in professional training programs focused on ASD greatly fosters special education teachers' knowledge, attitudes, skills, and abilities. Similarly, it is observed that special education teachers use tailored and adaptive teaching strategies and personalized approaches to address difficulties when implementing targeted professional development programs emphasizing inclusive and innovative instructional techniques. Lastly, it has been shown that implementing strategies recommended by psychologists like behavioral interventions customized learning plans, and sensory integration techniques improves appropriate educational interventions for children with autism.

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Appendices

Appendix A

Teachers' Questionnaire

Dear Teachers,

Thank you for participating in this survey. Your responses will be valuable for a research study evaluating the impact of professional training on spectrum disorders for special education teachers. We kindly request that you respond to the following questions truthfully and to the best of your knowledge.

Section One: Personal/Demographic Information

- Gender:

- Male

- Female

- Field of study:

- Years of teaching autistic children:

Section Two: Teachers' Perspectives on Professional Training

1. Do you think you have enough experience as a special education teacher?

- Yes

- No

2. Do you read materials related to autism spectrum disorders? If yes, please specify.

- Yes

- No

3. Do you reflect on your process of teaching autistic children?

- Yes

- No

4. How do you promote appropriate educational interventions for autistic children?

- a. Reading updated materials

- b. Collaboration with colleagues
- c. Collaboration with parents and specialists
- d. Pursuing professional training and workshops

Section Three: Teachers' Perspectives on Professional Training

1. What are your perspectives and attitudes toward professional training programs on autism spectrum disorders?

- It provides valuable knowledge and skills
- It addresses the needs and challenges of autism
- It provides care and support to individuals with ASD

2. Have you received any formal training in how to deal with autistic children? If yes, please specify the type of training you received (e.g., workshops, courses, certifications). If not, have you developed your skills autonomously?

- Yes
- No

3. How often have you engaged in professional training (workshops, seminars)?

- Always
- Often
- Sometimes
- Rarely
- Never

4. Have you noticed any changes in your teaching practices or interactions with autistic children as a result of the training you received?

- Yes
- No

5. How would you rate the importance of professional training for special education teachers?

- Very important
- Little
- Somehow
- Not important

6. How would you rate the level of institutional support provided for the professional development of teachers?

- Very important
- Little
- Somehow
- Not important

efforts.

Thank you for your time and

Appendix B

Teacher's Interview

1. How confident do you think you are in your ability to teach pupils with autism spectrum

disorders? Uncomfortable, somewhat comfortable, very comfortable?

Kindly include further details in your response.

2. Could you provide a particular example of how professional development has helped you to improve performance with ASD students?

3. What significant knowledge did you get from the professional development sessions?

4. Have you faced any difficulties while applying the techniques you learned from professional development programs? If so, describe how you overcame them.

5. Would you recommend extensive professional development opportunities to educators?

Kindly explain why .

Summary

The rising prevalence of Autism Spectrum Disorder (ASD) necessitates all special education teachers to become knowledgeable about ASD, and capable of meeting the learning needs of children with ASD in the classroom. This dissertation addresses the role of professional development on autism spectrum disorders for special education teachers and investigates how professional development programs impact the effectiveness of special education teachers in Algeria, focusing on their ability to support children with ASD. The study utilizes a mixed-methods approach, combining quantitative surveys and qualitative interviews with 60 special education teachers from different educational centers. The results show that even though professional development greatly improves teachers' knowledge and abilities there are still difficulties in applying those skills in the real world because of a lack of practice opportunities. Furthermore educational interventions for children with autism benefit from the use of psychologist-recommended tactics like behavioural interventions and sensory integration techniques. It is suggested that in order to create an inclusive learning environment advanced training modules be integrated and institutional support be increased.

ملخص

يتطلب الانتشار المتزايد لاضطراب طيف التوحد من جميع معلمي التعليم الخاص أن يصبحوا على دراية باضطراب طيف التوحد، وقادرين على تلبية احتياجات التعلم للأطفال المصابين باضطراب طيف التوحد في الفصل الدراسي. تتناول هذه الأطروحة دور التطوير المهني في اضطرابات طيف التوحد لمعلمي التربية الخاصة وتبحث في كيفية تأثير برامج التطوير المهني على فعالية معلمي التربية الخاصة في الجزائر، مع التركيز على قدرتهم على دعم الأطفال المصابين باضطراب طيف التوحد. أجريت هذه الدراسة في تيارت بالجزائر، واستخدمت منهجًا متعدد الأساليب، يجمع بين المسوحات الكمية والمقابلات النوعية مع 60 معلمًا للتعليم الخاص من مراكز تعليمية مختلفة. وتظهر النتائج أنه على الرغم من أن التطوير المهني يحسن بشكل كبير معرفة المعلمين وقدراتهم، إلا أنه لا تزال هناك صعوبات في تطبيق تلك المهارات في العالم الحقيقي بسبب نقص فرص الممارسة. علاوة على ذلك، تستفيد التدخلات التعليمية للأطفال المصابين

بالتوحد من استخدام التكتيكات الموصى بها من قبل علماء النفس مثل التدخلات السلوكية وتقنيات التكامل الحسي. ومن المقترح أنه من أجل خلق بيئة تعليمية شاملة، يتم دمج وحدات التدريب المتقدمة وزيادة الدعم المؤسسي.

Résumé

La prévalence croissante du trouble du spectre de l'autisme (TSA) rend nécessaire que tous les enseignants en éducation spécialisée se familiarisent avec le TSA et soient capables de répondre aux besoins d'apprentissage des enfants atteints de TSA en classe. Cette thèse aborde le rôle du développement professionnel sur les troubles du spectre de l'autisme pour les enseignants en éducation spécialisée et examine comment les programmes de développement professionnel impactent l'efficacité des enseignants en éducation spécialisée en Algérie, en se concentrant sur leur capacité à soutenir les enfants atteints de TSA. Menée à Tiaret, en Algérie, l'étude utilise une approche mixte, combinant des enquêtes quantitatives et des entretiens qualitatifs avec 60 enseignants en éducation spécialisée de différents centres éducatifs. Les résultats montrent que même si le développement professionnel améliore grandement les connaissances et compétences des enseignants, il reste des difficultés à appliquer ces compétences dans le monde réel en raison d'un manque d'opportunités de pratique. De plus, les interventions éducatives pour les enfants autistes bénéficient de l'utilisation de tactiques recommandées par les psychologues telles que les interventions comportementales et les techniques d'intégration sensorielle. Il est suggéré que pour créer un environnement d'apprentissage inclusif, des modules de formation avancée soient intégrés et que le soutien institutionnel soit renforcé. Mots-clés : Trouble du spectre de l'autisme, Enseignants en éducation spécialisée, Développement professionnel, Algérie, Interventions éducatives, Programmes de formation des enseignants.