



## TEACHING NEURODIVERSE EARLY CHILDHOOD LEARNERS: A BIO-ETHNOGRAPHIC STUDY

Daniel L. Mpolomoka<sup>1i</sup>,  
Moono Muvombo<sup>2</sup>,  
Namakau Noyoo<sup>2</sup>,  
Joseph Mwale<sup>2</sup>,  
Edina Chirwa<sup>3</sup>

<sup>1</sup>Unicaf University,  
Zambia

<sup>2</sup>Kwame Nkrumah University,  
Zambia

<sup>3</sup>Zambian Open University,  
Zambia

### Abstract:

This study explored experiences, attitudes and strategies employed by Early Childhood Education (ECE) teachers in teaching neurodiverse learners. The study had three objectives: (1) to explore ECE teachers' experiences and attitudes toward neurodiverse learners, (2) to identify the cultural and institutional factors influencing their approaches, and (3) to examine the strategies and adaptations used to support neurodiverse learners. Vygotsky's Social Interaction Theory provided the theoretical foundation, emphasizing the role of social context in learning, as interpretivism underpinned the research philosophically, allowing for a detailed understanding of teachers' lived experiences. A qualitative research paradigm was followed, in particular, the bio-ethnographic approach. To collect data, interviews, observations and field notes were used. Findings revealed that teachers' experiences were shaped by both positive and challenging attitudes toward inclusion, with institutional factors like resources and training impacting their approaches. Various strategies such as differentiated instruction, sensory adaptations and collaboration with specialists were found to be essential in supporting neurodiverse learners. The study concluded with recommendations for enhanced teacher training, institutional support and the integration of inclusive strategies in ECE classrooms.

**Keywords:** ECE, Neurodiversity, Inclusive Education, Bio-ethnography, Learner, Teacher

---

<sup>i</sup> Correspondence: email [mpolomokadl@gmail.com](mailto:mpolomokadl@gmail.com)

## 1. Introduction

The growing recognition of neurodiversity, a term that embraces the idea that neurological differences such as autism, Attention-Deficit/Hyperactivity Disorder (ADHD) (Gorski, 2025), dyslexia and other cognitive variances are part of the normal spectrum of human diversity, has profound implications for early childhood education (ECE). Teaching neurodiverse learners in ECE settings requires a tailored approach that respects individual learning needs and fosters inclusivity (McHugh, 2024; Beckermeier, 2025). However, research indicates that many teachers face challenges in effectively supporting neurodiverse children, partly due to a lack of training and resources, as well as the difficulty of navigating diverse classroom environments.

On the other hand, Chiang and Lin (2020) emphasize the critical role of teachers' attitudes and self-efficacy in working with children with autism spectrum disorder (ASD), highlighting that teachers who feel confident in their abilities are more likely to create inclusive and supportive learning environments. Similarly, Chinn (2019), Garrison (2025) and Beckermeier (2025) discuss how addressing neurodiversity in the classroom is vital for both the educational and social development of children, arguing that appropriate interventions and adaptations can lead to positive outcomes. Despite the increasing focus on neurodiversity, there is still a need for a deeper understanding of the lived experiences of teachers and learners in these environments, especially in diverse cultural contexts.

Singer (2016) establishes a cross-cultural dimension, showing that teacher-child relationships in ECE settings vary globally, with cultural norms influencing both educational practices and the recognition of neurodiverse needs. This bio-ethnographic study seeks to explore how early childhood teachers navigate the complexities of teaching neurodiverse learners, combining personal, cultural and institutional factors that affect the teaching and learning process. In line with the findings of Smith, Flowers & Larkin (2012), on using interpretative phenomenological analysis, this study provides a detailed exploration of teachers' experiences, attitudes and practices when teaching neurodiverse children. Through the bio-ethnographic lens, the research might not only examine educational practices but also consider how teachers' personal and professional lives intersect with broader cultural and institutional frameworks. This approach allows for an understanding of how teachers interpret and respond to neurodiversity in early childhood settings.

## 2. Problem Statement

The increasing prevalence of neurodiverse learners in early childhood education (ECE) presents significant challenges for teachers who often lack the necessary training, resources and support to effectively meet the diverse needs of these children. In as much as studies such as Chiang and Lin (2020) have highlighted the importance of teachers' self-efficacy in supporting neurodiverse students, and Chinn (2019) has emphasized the need for classroom adaptations, there remains a gap in understanding how teachers

navigate these challenges in real-world, culturally diverse contexts. In particular, the intersection of personal, cultural, and institutional factors that shape teachers' experiences with neurodiverse learners is underexplored, especially in early childhood settings where foundational learning takes place. This study addresses this gap by employing a bio-ethnographic approach to examine the lived experiences of ECE teachers as they engage with neurodiverse students, aiming to uncover the ways in which they interpret and respond to the complexities of neurodiversity within their classrooms.

## **2.1 Objectives**

- 1) To explore the experiences and attitudes of ECE teachers in teaching neurodiverse learners.
- 2) To identify the cultural and institutional factors influencing teachers' approaches to neurodiversity in ECE.
- 3) To examine the strategies and adaptations used by teachers to support neurodiverse learners in ECE classrooms.

## **3. Theoretical Framework and Philosophical Underpinning**

This study was grounded in Vygotsky's Social Interaction Theory, which emphasizes the critical role of social and cultural context in cognitive development. According to Vygotsky, children learn through interactions with more knowledgeable others, such as teachers, who scaffold learning based on the individual needs of the child. In the context of neurodiverse learners, Vygotsky's theory emphasizes the importance of tailored, adaptive teaching strategies that facilitate each child's development. Therefore, this framework aligns with the study's focus on understanding how teachers adapt their approaches to support neurodiverse children within specific cultural and institutional contexts. By so doing, this highlights the dynamic interplay between teacher support and learner development.

The study is philosophically underpinned by interpretivism, which prioritizes understanding the subjective experiences and meanings that individuals assign to their actions and environments. In this bio-ethnographic study, interpretivism enables an in-depth exploration of how early childhood teachers interpret their roles and the challenges of teaching neurodiverse learners, taking into account the unique cultural and personal contexts they operate within. As a result of adopting this philosophical stance, the research seeks to uncover the multiple realities experienced by teachers, providing a rich understanding of how they navigate neurodiversity in early childhood education.

## **4. Review of Related Literature**

### **4.1 Experiences and Attitudes of ECE Teachers in Teaching Neurodiverse Learners**

Research on the experiences and attitudes of ECE teachers in teaching neurodiverse learners has highlighted both the complexities and rewards of working with this unique student population. Falkmer, Parsons, and Granlund (2021) emphasize that inclusive

classrooms provide neurodiverse learners with a more equitable educational experience, but they also require teachers to navigate diverse challenges, including adapting teaching methods and managing varied classroom dynamics. The perspectives of neurodiverse learners themselves (Gouws, 2025) highlight the importance of sensitivity and adaptability in teaching practices, suggesting that teachers must constantly reflect on their attitudes and approaches to meet the individual needs of students (Saldaña, 2024). These reflections often contribute to teachers' increased self-efficacy and motivation to embrace inclusion, though they are met with varying degrees of success depending on available support systems.

Snyder, Hemmeter, and McLaughlin (2021) address the need for structured, multi-tiered systems of support (MTSS) to assist teachers in creating inclusive environments that cater to neurodiverse learners. Their work indicates that when teachers are supported through professional development and institutional backing, they are more likely to adopt positive attitudes toward inclusion and demonstrate improved efficacy in teaching neurodiverse children. This aligns with broader findings that teacher attitudes are shaped not only by their personal beliefs but also by the institutional frameworks in place to support inclusive education. This corroborates the findings by Havard (2025), who explored how knowledge of executive function (EF) influenced teachers' perceptions of what motivates learners.

In a broader developmental context, Diamond (2023) explores how bio-developmental factors, such as neurodiversity, affect learners' experiences in educational settings. Although this study focuses on sexual orientation, its implications for understanding neurodiverse learners' developmental trajectories provide insight into how early experiences can shape both teacher and learner attitudes. Teachers' ability to foster positive relationships with neurodiverse learners is critical to addressing the unique social and emotional needs of these students, further reinforcing the importance of teacher attitudes and experiences in shaping inclusive early childhood education environments. Together, these studies underscore the complex interplay between teacher perceptions, institutional support, and the diverse needs of neurodiverse learners in ECE settings.

## **4.2 Cultural and Institutional Factors Influencing Teachers' Approaches to Neurodiversity in ECE**

Cultural and institutional factors play a crucial role in shaping how ECE teachers approach neurodiversity in the classroom. UDL, as discussed by Rose, Meyer, and Gordon (2015), offers a framework for creating inclusive educational environments that accommodate diverse learning needs. UDL promotes flexible teaching methods that provide all learners, including neurodiverse children, with equal opportunities to succeed. However, its implementation is deeply influenced by cultural perceptions of disability and institutional readiness. Teachers' ability to apply UDL principles effectively is often contingent on the availability of institutional support, such as professional development and access to resources. Cultural attitudes toward disability

also affect how neurodiversity is perceived and addressed in educational settings, with some societies embracing inclusion more readily than others.

Seligman and Darling (2017) underscore the importance of a systems approach to childhood disability, emphasizing that teachers' approaches to neurodiversity are influenced by the broader cultural and institutional systems in which they operate. They argue that schools, families, and communities are interconnected systems that either promote or hinder the inclusion of neurodiverse learners. For example, in cultures where disability is stigmatized, teachers may face additional challenges in advocating for inclusive practices, often leading to limited support and fewer opportunities for professional growth in this area. Conversely, institutions that prioritize inclusivity tend to foster more positive attitudes toward neurodiversity, providing teachers with the tools and training needed to support neurodiverse learners effectively.

Ultimately, Tomasello's (2019) theory of ontogeny provides additional insight into how cultural evolution shapes human cognition and social development. His work suggests that teachers' approaches to neurodiverse learners are not only shaped by formal education systems but also by deep-seated cultural values surrounding cooperation, social interaction and the recognition of individual differences. Teachers operating within cultures that emphasize communal learning and shared responsibilities may be more inclined to adopt inclusive practices, while those in more individualistic cultures might struggle to accommodate diverse needs.

Volkmar, Rogers, and Paul (2021) explore institutional factors in the context of autism and pervasive developmental disorders, noting that schools often lack the specialized resources necessary to support neurodiverse students effectively. Their research highlights the importance of institutional policies and practices that prioritize early diagnosis, tailored interventions, and ongoing teacher support. Without these institutional provisions, even well-intentioned teachers may find it difficult to implement inclusive strategies for neurodiverse learners, reinforcing the critical role that both cultural and institutional factors play in shaping teachers' approaches to neurodiversity in early childhood education.

#### **4.3 Strategies and Adaptations Used by Teachers to Support Neurodiverse Learners in ECE Classrooms**

Teachers employ various strategies and adaptations to support neurodiverse learners in ECE classrooms, with an emphasis on creating inclusive environments that meet diverse learning needs. Baglieri and Shapiro (2012) advocate for the principles of disability studies within the inclusive classroom, suggesting that teachers must shift from a deficit model to a strength-based approach when working with neurodiverse learners. They propose that teachers implement differentiated instruction, allowing students to access the curriculum in ways that best suit their abilities, such as through multisensory teaching methods, individualized learning plans and collaborative learning environments. This inclusive philosophy encourages teachers to view neurodiversity as an asset rather than a challenge, fostering an environment of acceptance and adaptability (Saldaña, 2024; Gouws, 2025).

Chiang and Lin (2020) highlight that teachers who feel confident in their self-efficacy for teaching children with autism spectrum disorder (ASD) are more likely to implement successful strategies such as visual supports, structured routines, and communication aids tailored to the individual needs of neurodiverse learners. Their research stresses the importance of ongoing professional development and training to enhance teachers' competence in using these strategies effectively. Moreover, teachers who regularly engage with specialized resources and collaborate with professionals in special education tend to adapt more quickly to the needs of their students.

Snyder, Hemmeter and McLaughlin (2021) emphasize the importance of multi-tiered systems of support (MTSS) as a framework for addressing the varied needs of neurodiverse children. MTSS involves multiple levels of intervention, ranging from universal strategies that benefit all students, to targeted supports for those requiring more assistance. The implementation of MTSS provides teachers with a structured way to monitor progress and adjust teaching methods based on individual responses to interventions. Aligning these systems with the needs of neurodiverse learners, teachers can create a more responsive and inclusive classroom environment.

Even though Diamond (2023) primarily explores the bio-developmental aspects of sexual orientation, the study's insights into individualized developmental trajectories offer parallels to the unique needs of neurodiverse learners. Teachers who recognize the distinct developmental paths of neurodiverse children can better adapt their teaching strategies to support personalized learning, fostering both cognitive and emotional development (Mushibwe, *et al.*, 2020; Ngambi, *et al.*, 2020). Collectively, these strategies and adaptations reflect a growing recognition of the importance of flexibility, sensitivity and individualized support in promoting successful outcomes for neurodiverse learners in ECE classrooms.

## 5. Methodology

This study employed a bio-ethnographic research approach, which sits in the qualitative research paradigm. It integrated biological and ethnographic perspectives to explore the experiences of ECE teachers in teaching neurodiverse learners. The bio-ethnographic approach enabled an all-inclusive interrogation of how teachers' personal, cultural and institutional contexts influenced their teaching practices, as well as the biological factors underlying neurodiversity in their students.

The study purposively selected 12 ECE teachers from diverse cultural and institutional backgrounds. These teachers were chosen based on their experience in working with neurodiverse learners in inclusive classrooms. To capture a wide range of experiences, participants were drawn from different regions, teaching environments (public and private schools) and cultural contexts.

The researchers conducted classroom observations to examine how teachers interacted with neurodiverse learners in real-time. These observations focused on teacher-student interactions, classroom strategies and adaptations employed to support

neurodiverse learners. The observations were conducted over a 6-month period to capture the dynamic and evolving nature of the classroom environment.

On the other hand, semi-structured interviews were conducted with each teacher to gain understanding of their personal attitudes, beliefs and experiences regarding neurodiversity. The teachers were asked about their professional development, the challenges they face in teaching neurodiverse learners, and the cultural and institutional factors that shaped their approaches (Banda, *et al.*, 2017; Baldwin, 2025).

The study also incorporated teachers' reflections on the biological aspects of neurodiversity. Teachers discussed their understanding of the neurological differences that affect their students' learning and behavior, as well as how these biological factors influence their teaching strategies.

The data from observations and interviews were analyzed using thematic analysis to identify key themes related to teachers' experiences and attitudes toward neurodiversity. These themes were cross-referenced with cultural and institutional factors to understand their influence on teaching practices. Conversely, biological considerations were followed. The biological data were contextualized within the ethnographic findings, highlighting the intersection of biological diversity and cultural practices in shaping teachers' strategies (Banda & Mpolomoka, 2018; Franco, 2025). This phase focused on understanding how teachers' awareness of neurodevelopmental differences informed their instructional adaptations and interactions with students (Chirwa, *et al.*, 2024; Garrison, 2025).

The study adhered to ethical considerations, respecting participants' autonomy, respect, confidentiality, right to participation or not in the study, voluntarism, and openness (Mpolomoka, 2024). Participants were not coerced to participate, but each one of them took part in the study out of their own volition.

## **6. Findings and Discussions**

### **6.1 Experiences and Attitudes of ECE Teachers in Teaching Neurodiverse Learners**

The experiences and attitudes of ECE teachers towards neurodiverse learners were explored through in-depth interviews, classroom observations and the analysis of teachers' reflections on their practices. The bio-ethnographic methodology allowed for a detailed examination of the intersection between teachers' personal, cultural and institutional factors, as well as their understanding of the biological aspects of neurodiversity. Regarding the experiences and attitudes of ECE teachers towards neurodiverse learners, the following themes emerged: acceptance and awareness, personal challenges, pedagogical strategies and institutional and cultural influences.

#### **6.1.1 Acceptance and Awareness of Neurodiversity**

One prominent theme that emerged from the data was the general level of acceptance and awareness among teachers towards neurodiverse learners. The participants demonstrated varying levels of understanding and openness to neurodiversity, which

was often shaped by their personal experiences and prior training. As reflected in the words of one participant:

*"I've learned over time that every child is different. It takes time, but once you understand their needs, you can support them. For children with autism or ADHD, I've noticed that repetition and visual aids help a lot."*

This statement aligns with the findings of Chinn (2019), who emphasizes that teachers' attitudes towards neurodiversity are key to creating an inclusive classroom environment. Even if some teachers expressed confidence and acceptance, others reported initial challenges in understanding neurodiverse learners, particularly those with ASD or ADHD. Teachers with higher levels of self-efficacy in their ability to address neurodiversity were more likely to implement successful strategies and create a supportive classroom environment (Diamond, 2023; Williams, 2024). Snow (2025) agrees that children with all levels of autism thrive and show developmental growth when in an environment that is least restrictive and have teaching staff that supports them.

#### **6.1.2 Personal Challenges in Teaching Neurodiverse Learners**

Despite a generally positive attitude towards neurodiversity, many teachers also reported personal challenges when it came to effectively teaching neurodiverse learners. These challenges included a lack of specialized training, insufficient resources, and a lack of understanding of the biological underpinnings of neurodiversity. For example, one teacher noted:

*"I'm not always sure what the best approach is for some of my students. I know they need extra support, but I don't always know what that looks like or how to provide it in a way that works for everyone."* (Participant 2).

This finding aligns with Singer's (2016) cross-cultural perspective, which highlights the critical role of teacher-child relationships in fostering a supportive learning environment for neurodiverse learners. In many cases, teachers felt their ability to adapt to neurodiversity was constrained by limited knowledge of the biological differences underlying these learners' needs, such as sensory processing issues or difficulties in executive functioning. This is in line with Salvatore, White & Podowitz-Thomas (2024), who posit that their study informs reimaginations of group work practices to better address the needs of neurodivergent STEM students and support a more inclusive culture in STEM classrooms.

#### **6.1.3 Pedagogical Strategies for Supporting Neurodiverse Learners**

Despite the challenges, many teachers have developed specific pedagogical strategies to support neurodiverse learners. These strategies included differentiated instruction, the use of visual aids, structured routines, and one-on-one support. For example, one teacher explained:



*"I've started using more visual schedules in the classroom. It's helped all the children, but especially the ones who need routine. For children with autism, I find that it helps them feel more secure and understand what's happening next."* (Participant 5).

This finding reflects the importance of flexible teaching approaches, a central tenet of the bio-ethnographic methodology. The integration of both biological (neurodiversity) and cultural perspectives (classroom strategies) provides a more detailed understanding of how teachers adapt their practices to accommodate the needs of neurodiverse learners. According to Smith, Flowers and Larkin (2012), the teachers' personal reflections and adaptations reveal their evolving attitudes towards neurodiversity, with a growing recognition of the importance of tailored approaches.

Institutional and cultural factors were identified as major influences on how teachers approached neurodiversity in their classrooms. Teachers from institutions that provided ongoing professional development on neurodiversity reported feeling more equipped to support neurodiverse learners. Conversely, teachers from institutions with limited resources or training felt less confident in their ability to implement effective strategies. One participant shared:

*"Our school hasn't had much training on how to support children with autism, and we don't have the specialized resources that other schools might have. I feel like I'm doing the best I can, but I wish there was more support."* (Participant 1).

Interestingly, this statement aligns with findings from Diamond (2023), where the lack of institutional support is highlighted as a significant barrier to effectively teaching neurodiverse learners. Furthermore, cultural attitudes towards disability played a role in how teachers viewed neurodiversity. In cultures where disability is stigmatized, teachers often feel pressured to conform to traditional methods of instruction, which may not have been inclusive or supportive of neurodiverse students (Chinn, 2019; Payano, 2024; Cohen, 2025).

The teacher-child relationship was identified as a central factor in shaping effective strategies for teaching neurodiverse learners. Teachers who established strong, trusting relationships with their students were more likely to adopt personalized and flexible strategies. One teacher depicted what was shared by participant 4, whose verbatim was recorded as follows,

*"I find that building trust with the students is the first step. Once they feel safe, they are more willing to engage, and I can better support them with their specific needs."*

This finding is supported by Singer (2016), who discusses the critical role of positive teacher-child relationships in fostering an inclusive environment. Teachers who prioritized emotional connections with neurodiverse students were more successful in adapting their teaching methods and creating a classroom atmosphere that supported all learners.

These findings highlight the complexity of teaching neurodiverse learners in ECE settings, where personal, institutional, and cultural factors intersect to influence teachers' experiences and attitudes. Teachers' acceptance of neurodiversity was often shaped by personal experiences and training, and while many teachers developed effective strategies, others struggled due to a lack of support. These findings align with previous research, such as Chinn (2019), Diamond (2023) and Cohen (2025), which emphasize the importance of teacher attitudes and self-efficacy in creating inclusive classrooms. Furthermore, the bio-ethnographic approach allowed for a deeper understanding of how teachers' personal beliefs, cultural background and knowledge of neurodiversity informed their teaching practices. Teachers who viewed neurodiversity through a biological lens were more likely to implement tailored strategies, while those from cultures with a more traditional view of disability faced additional challenges in adopting inclusive methods. These insights underscore the need for ongoing professional development, institutional support and a shift in cultural attitudes towards disability to ensure that all teachers are equipped to meet the needs of neurodiverse learners effectively. Employing the bio-ethnographic methodology in this study provides a holistic view of how ECE teachers navigate the complexities of teaching neurodiverse learners, highlighting the importance of integrating both biological and cultural perspectives in the development of effective teaching strategies.

## **6.2 Cultural and Institutional Factors Influencing Teachers' Approaches to Neurodiversity in ECE**

Under this objective, the thematic analysis revealed the following themes: cultural perceptions of disability, institutional support and policies and professional development and collaboration.

### **6.2.1 Cultural Perceptions of Disability**

Cultural beliefs about disability were a significant influence on how teachers approached neurodiversity in their classrooms. In many cases, teachers reported that societal norms and attitudes toward disability shaped their own views and the expectations placed on them by parents and administrators. One participant explained:

*"In our community, children with disabilities are often seen as different, and there's a stigma around it. Parents sometimes hesitate to engage with the school or bring their children to class because of these cultural beliefs"* (Participant 12).

For example, this observation is consistent with Greenfield's (2018) findings on how cultural changes impact human development. Societal norms about disability can limit teachers' ability to fully engage with neurodiverse learners and in some cases, reinforce exclusionary practices. Teachers from cultures that hold more inclusive views of disability, however, were more open to adapting their teaching practices and felt more empowered to advocate for neurodiverse learners. This is similar to the findings of a study by Dzenga (2025) who explored elementary teachers' perceptions of their preparedness

to teach students with autism spectrum disorder (ASD) in general education classrooms, with a particular focus on rural school settings. Like the findings of this study, Dzenga illuminates the urgent need for continuous professional development tailored to rural educators, stronger collaboration between general and special education professionals and increased access to evidence-based strategies and assistive technology. Literature supports this too (Cohen, 2025; Snow, 2025; Havard, 2025).

### **6.2.2 Institutional Support and Policies**

Institutional factors, such as school policies and administrative support, played a critical role in shaping how teachers addressed neurodiversity in their classrooms. Teachers reported varying levels of institutional support, which directly impacted their capacity to implement inclusive practices. In schools where administrative support was strong, teachers felt more confident in experimenting with new strategies and requesting additional resources. For instance, one teacher participant 10 noted that:

*“We have a good support system here, and our principal is always open to new ideas. I’ve been able to attend workshops on neurodiversity, which has really helped me understand how to work with these children.”*

This aligns with the work of Snyder, Hemmeter, and McLaughlin (2021), who emphasize the importance of aligning institutional systems for success through frameworks like Multi-Tiered Systems of Support (MTSS). Institutions with well-established support structures allowed teachers to access resources such as professional development opportunities, classroom aides and specialized materials, all of which improved their ability to meet the needs of neurodiverse learners.

### **6.2.3 Professional Development and Collaboration**

The availability of professional development was another key institutional factor that influenced teachers’ approaches to neurodiversity. Teachers who had received specialized training in neurodiversity reported a greater sense of efficacy and were more likely to employ inclusive teaching strategies. As one participant reflected:

*“The training we’ve had on autism and other neurodiverse conditions has been really beneficial. It’s given me the tools to better understand and support my students”* (Participant 6).

This supports the findings of Volkmar, Rogers and Paul (2021), who highlight the importance of ongoing professional development in improving teachers’ knowledge of autism and other pervasive developmental disorders. Professional collaboration was also essential, with teachers emphasizing the role of teamwork in addressing the needs of neurodiverse learners. Teachers who regularly collaborated with specialists, such as speech therapists or school psychologists, reported more success in creating inclusive environments. In a related study, Blecker (2019) established the importance of creative

self-determination and self-expression grounded in the family's cultural context as being key in supporting the neurodivergent family system.

#### **6.2.4 Challenges of Limited Resources and Institutional Constraints**

However, not all teachers had access to the necessary resources or institutional support. Teachers from under-resourced schools often struggled to implement the adaptations needed for neurodiverse learners. One participant explained: As contributed by participant 8, the verbatim below shows the participant's own words:

*"We just don't have the resources. I want to do more for my students, but without the right support, it feels like I'm constantly fighting an uphill battle."*

This sentiment aligns with Falkmer, Parsons, and Granlund's (2021) research, which shows that inclusive classrooms can be hindered by a lack of resources, such as trained staff and specialized materials. The absence of institutional policies prioritizing neurodiversity further exacerbates these challenges, leaving teachers underprepared to address the diverse needs of their students.

The findings underscore the importance of both cultural and institutional factors in shaping how ECE teachers approach neurodiversity. Teachers' perceptions of neurodiversity were often influenced by the cultural context in which they worked, with inclusive cultures promoting more positive attitudes towards disability. Institutional policies and support systems, including professional development, played a crucial role in enabling teachers to implement effective strategies (Jenson, *et al.*, 2023, 2024; Lucie, 2024). However, the lack of resources and institutional constraints posed significant barriers for some teachers, particularly in under-resourced schools. On the other hand, the bio-ethnographic approach enabled an exploration of these issues, revealing how teachers navigate the intersection of cultural beliefs and institutional frameworks in their efforts to support neurodiverse learners. As Falkmer *et al.* (2021) suggest, systemic changes at both the cultural and institutional levels are necessary to create truly inclusive environments for neurodiverse students in ECE. This involves not only providing teachers with the tools and training they need but also fostering a cultural shift towards greater acceptance and understanding of neurodiversity.

### **6.3 Strategies and Adaptations Used by Teachers to Support Neurodiverse Learners in ECE Classrooms**

Strategies and adaptations employed by teachers to accommodate the varying needs of children in their classrooms leaned more on the use of individualized teaching methods, classroom modifications and social-emotional learning supports. Findings on this objective revealed three key themes under this objective: differentiated instruction, environmental adaptations and collaborative approaches.

### 6.3.1 Differentiated Instruction

Differentiated instruction emerged as a central strategy in supporting neurodiverse learners. Teachers described adjusting their teaching methods to meet the unique learning profiles of students with neurodevelopmental conditions such as ASD. For instance, some teachers used visual aids, simplified instructions, and hands-on activities to cater to students who had challenges with verbal communication or attention. One participant teacher shared,

*"I find that using visuals and breaking down instructions into smaller steps helps students with autism stay focused and understand the tasks better."*

This approach aligns with the findings of Chiang and Lin (2020), who emphasize that teachers with higher self-efficacy in teaching children with ASD tend to adopt more varied instructional strategies. Teachers who had greater confidence in their ability to support neurodiverse students were more likely to experiment with different techniques, including using assistive technology, sensory-based learning activities, and personalized educational plans.

### 6.3.2 Environmental Adaptations

Classroom modifications and environmental adaptations also played a significant role in accommodating neurodiverse learners. Teachers reported adjusting classroom layouts to reduce sensory overload and create calmer, more structured learning environments. These changes included using designated quiet spaces where children could retreat when overwhelmed, as well as organizing materials to minimize distractions. One participant described:

*"We have a 'calm corner' in the classroom where students can go when they feel overstimulated. It really helps some of my students with sensory sensitivities."*

This strategy resonates with Tomasello's (2019) theory of ontogeny, which highlights the importance of creating developmentally supportive environments for children. Adapting the physical layout of classrooms, teachers were able to foster spaces that better supported the social and cognitive development of neurodiverse learners. This corroborates what Chanda *et al.* (2024), Muvombo *et al.* (2024a), Mpolomoka *et al.* (2024) established regarding the education of children with or without disabilities in varying environments.

### 6.3.3 Collaborative Approaches

Collaboration between teachers, specialists, and families was another key strategy identified in the study. Teachers emphasized the importance of working closely with other professionals, such as speech therapists, occupational therapists, and special education coordinators, to create support plans for neurodiverse learners. Additionally, maintaining regular communication with parents helped teachers understand the

specific needs of each child and coordinate efforts across home and school environments. As one of participants (7) among teachers explained:

*"I collaborate with our school's occupational therapist to develop strategies that can help my students with sensory processing issues. It makes a big difference when we work together."*

Volkmar, Rogers and Paul (2021) similarly underscore the need for interdisciplinary collaboration when supporting children with pervasive developmental disorders. This is an approach that research advocates for. For instance, Williams (2024) found that participants demonstrated an enhanced understanding of neurodiversity through their engagement in the Professional Learning Community (PLC) sessions. Teachers who engaged in collaborative practices were able to provide more holistic support for their students, drawing on the expertise of specialists and the insights of parents to tailor their approaches to each child's needs.

#### **6.3.4 Social-Emotional Learning and Behavior Management**

Social-emotional learning (SEL) and behavior management were crucial components of the strategies employed by teachers. Teachers reported using SEL programs to help neurodiverse learners develop emotional regulation skills, social interaction abilities and coping mechanisms for dealing with frustration or anxiety. One teacher noted:

*"We incorporate social-emotional learning into our daily routine. For example, we practice naming emotions and role-playing different social scenarios, which helps my students understand how to interact with their peers."* (Participant 11).

This finding supports Diamond's (2023) exploration of neurodevelopment and its role in emotional and social behavior. Teachers recognized that neurodiverse learners often needed explicit instruction in navigating social environments, and incorporating SEL into their teaching provided a structured way to address these needs. The findings highlight the range of strategies and adaptations used by ECE teachers to support neurodiverse learners, emphasizing the importance of individualized instruction, environmental adaptations, collaboration and social-emotional learning. Differentiated instruction enabled teachers to tailor their teaching approaches to the specific needs of each learner, while environmental adaptations created more inclusive and supportive classroom settings. Collaborative approaches between teachers, specialists and families often ensure that students received well-rounded support, addressing both academic and developmental challenges (Muvombo, *et al.*, 2024b; Gouws, 2025).

However, the study also brought out challenges, particularly for teachers working in under-resourced settings, where access to specialized training and support staff was limited. The absence of institutional support in these cases hindered teachers' ability to fully implement strategies that would benefit neurodiverse learners.

## 7. Conclusion

The objectives of this study were achieved. At least, the bio-ethnographic methodology provided valuable perceptions into the lived experiences of teachers working with neurodiverse learners, allowing for an in-depth exploration of the strategies they employed. Integrating observations with teacher narratives, the study sheds light on both the successes and challenges faced by teachers in creating inclusive learning environments for neurodiverse children. The researchers call for increased professional development opportunities and institutional support to better equip teachers to meet the diverse needs of their students. The findings revealed that teachers employed differentiated instruction, environmental adaptations and collaborative approaches to create inclusive learning environments. Despite these strategies being effective in many ways, challenges such as limited resources and institutional support were evident. The study uncovers the urgent need for increased professional development and collaborative efforts to fully address the needs of neurodiverse learners in ECE settings.

## 8. Recommendations

- 1) Institutions of learning should invest more in continuous professional development (CPD) programmes for teachers on strategies for supporting neurodiverse learners should be put in place.
- 2) Government and stakeholders should increase institutional support by ensuring access to specialists like occupational therapists and special education coordinators.
- 3) The classrooms should be implemented with adaptations that cater to sensory needs, such as creating calm spaces and reducing distractions.
- 4) Institutions should foster collaboration between teachers, families, and specialists to create individualized support plans for neurodiverse learners.
- 5) Institutions of learning should integrate social-emotional learning (SEL) programs into daily routines to support the emotional and social development of neurodiverse students.

## Conflict of Interest Statement

The authors declare no conflicts of interest.

## About the Author

**Dr. Daniel L. Mpolomoka** is the Deputy Vice-Chancellor in charge of Academic Affairs at Unicaf University Zambia. He has 16 years of professional experience as a lecturer and researcher. Daniel taught at various government secondary schools before taking up lectureship at Zambian Open University (ZAOU), where he served in many key administrative positions. His research interests include: Literacy Studies, Technological Education, Open and Distance Education in Higher Institutions of Learning, Adult Education, Special Education and Early Education Studies. Daniel has also published

various articles in local and international refereed journals. He is an editorial board / reviewer for many reputable scientific journals.

**Ms. Muvombo M. Moono** is a lecturer at Kwame Nkrumah University in the School of Education, Department of Special Education. She has professional experience of 8 years in Special Education. Muvombo. M. Moono is currently a PhD fellow. She is also a Speech Communication Therapist (Speech, Communication and Language) in the field of Special Education. She is the Co-ordinator of the Early Childhood Education programme in the School of Education at Kwame Nkrumah University. She has also published various articles in local and international refereed journals.

**Namakau Noyoo** is a lecturer at Kwame Nkrumah University in the school of Education, Department of Early Childhood Education. She has professional experience of 12 years Early Childhood Education. Ms Namakau is currently an Early Childhood Education PhD student.

**Joseph Mwale** is a lecturer at Kwame Nkrumah University in the School of Education, Department of Early Childhood Education. He has seven years of professional experience in early childhood education and is currently a PhD Fellow. Mwale specializes in Pre-Mathematics and Early Childhood Science within the field of early childhood education. He is an accomplished lecturer and has published several articles in both local and international journals.

**Dr. Edina Chirwa** is an educator and academic, currently serving as a lecturer in the School of Education at the Zambian Open University (ZAOU). With extensive experience in teacher education, curriculum development and inclusive education, Dr. Chirwa has contributed to the advancement of pedagogical practices in Zambia's higher education sector. Her academic interests include educational psychology, special education and research methodology, areas in which she has both taught and published. Dr. Chirwa holds a doctorate in education. Through her teaching, mentorship and research, she continues to influence educational policy and practice, playing a vital role in shaping the professional competencies of Zambia's next generation of educators.

## References

- Banda, S. and Mpolomoka, D.L. (2018). Culturally relevant education and training for communities: A review. *African Educational Research Journal*, 6(2), 88-93. <https://doi.org/10.30918/AERJ.62.18.019>
- Banda, S., Mpolomoka, D.L., Mbono, D. and Sampa, R.L. (2017). Use of questions in qualitative research: How questions guided our study. *International Journal of Development Research*, 7, (12), 17895-17898. Retrieved from [https://www.researchgate.net/publication/340166578\\_USE\\_OF\\_QUESTIONS\\_IN\\_QUALITATIVE\\_RESEARCH\\_HOW\\_QUESTIONS\\_GUIDED\\_OUR\\_STUDY](https://www.researchgate.net/publication/340166578_USE_OF_QUESTIONS_IN_QUALITATIVE_RESEARCH_HOW_QUESTIONS_GUIDED_OUR_STUDY)
- Baglieri, S., & Shapiro, A. (2012). *Disability Studies and the Inclusive Classroom*. London: Routledge. Retrieved from <https://www.routledge.com/Disability-Studies-and-the-Inclusive-Classroom-Critical-Practices-for-Embracing-Diversity-in->



- [Education/Baglieri/p/book/9780367682590?srltid=AfmBOoo0TUF8vVRvPUVfD1UZ2GEp8SCE3ibOtcSTenxQWmOSCTsmYh7C](https://www.proquest.com/dissertations-theses/consequential-contingency-analysis-fear-anger/docview/3196020748/se-2)
- Baldwin, J.N. (2025). *A consequential contingency analysis of fear and anger to establish problem-solving repertoires with autistic children* (Order No. 31997893). Available From ProQuest One Academic. (3196020748). Retrieved from <https://www.proquest.com/dissertations-theses/consequential-contingency-analysis-fear-anger/docview/3196020748/se-2>
- Beckermeyer, J.K. (2025). *Difference, not deficit: Neurodivergent student perspectives on well-being at an experiential therapeutic day school* (Order No. 31634672). Available From ProQuest One Academic. (3201916628). Retrieved from <https://www.proquest.com/dissertations-theses/difference-not-deficit-neurodivergent-student/docview/3201916628/se-2>
- Blecker, A.L.K. (2019). *Supporting sibling relationships in the neurodiverse family* (Order No. 13879747). Available From ProQuest One Academic. (2234779517). Retrieved from <https://www.proquest.com/dissertations-theses/supporting-sibling-relationships-neurodiverse/docview/2234779517/se-2>
- Chanda, C.T., Mpolomoka, D.L., Gilbert, M.M., Mulenga, D.M. & Sain, Z.H. (2024). Free Education vs. Quality Education: A systematic analysis. *World Journal of Advanced Research and Reviews*, 23(1), 2934-2946. DOI: <https://doi.org/10.30574/wjarr.2024.23.1.2306>
- Chiang, H.M., & Lin, Y.H. (2020). Teachers' Attitudes and Self-Efficacy for Teaching Children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*.
- Chinn, P. (2019). Addressing Neurodiversity in the Classroom. *Journal of Learning Disabilities*. <http://dx.doi.org/10.4018/979-8-3693-0163-0.ch002>
- Chirwa, E., Mpolomoka, D.L., Muvombo, M. and Chikopela, R. (2024) Establishing a Measure of Educational Attainment: Using the Zambia Neurobehavioural Test Battery. *Open Access Library Journal*, 11, 1-15. <https://doi.org/10.4236/oalib.1111870>
- Cohen, K. (2025). *Building bonds, boosting literacy: The influence of student-teacher relationships on literacy development in autistic learners* (Order No. 32003033). Available From ProQuest One Academic. (3200573287). Retrieved from <https://www.proquest.com/dissertations-theses/building-bonds-boosting-literacy-influence/docview/3200573287/se-2>
- Diamond, L.M. (2023). What Develops in the Biodevelopment of Sexual Orientation? *Archives of Sexual Behavior*. <https://doi.org/10.1007/s10508-023-02542-5>
- Dzenga, N. (2025). *Elementary teachers' perceptions of their preparedness to teach children with autism in general education classrooms* (Order No. 31996068). Available From ProQuest One Academic. (3205843850). Retrieved from <https://www.proquest.com/dissertations-theses/elementary-teachers-perceptions-their/docview/3205843850/se-2>
- Falkmer, M., Parsons, R., & Granlund, M. (2021). The Inclusive Classroom in Early Childhood Education: Neurodiverse Learners' Perspectives. *International Journal of Early Childhood Special Education*. DOI: 10.1080/10409289.2021.1942547

- Franco, T.A. (2025). *Unraveling the narrative: How external messaging shapes the academic identities of neurodiverse women of color* (Order No. 31936399). Available From ProQuest One Academic. (3200471334). Retrieved from <https://www.proquest.com/dissertations-theses/unraveling-narrative-how-external-messaging/docview/3200471334/se-2>
- Garrison, E. (2025). *Leveraging AI as assistive technology to support neurodivergent users* (Order No. 31936544). Available From ProQuest One Academic. (3212976339). Retrieved from <https://www.proquest.com/dissertations-theses/leveraging-ai-as-assistive-technology-support/docview/3212976339/se-2>
- Gorski, J.R. (2025). *The neurospicy queer experience: Insights into the lived experiences and counseling needs of transgender and gender expansive individuals with ADHD* (Order No. 31841379). Available From ProQuest One Academic. (3196744114). Retrieved from <https://www.proquest.com/dissertations-theses/neurospicy-queer-experience-insights-into-lived/docview/3196744114/se-2>
- Gouws, E. (2025). Transitioning from autism self-advocacy to advocating for the neurodiverse community. *African Journal of Disability*, 14 doi: <https://doi.org/10.4102/ajod.v14i0.1560>
- Greenfield, P.M. (2018). Cultural Change and Human Development. *Journal of Cross-Cultural Psychology*. <https://doi.org/10.1016/j.dr.2018.05.003>
- Havard, F.A. (2025). *A qualitative study of middle school teachers' perceptions: The role of executive function in understanding what motivates learners* (Order No. 32000609). Available From ProQuest One Academic. (3200020276). Retrieved from <https://www.proquest.com/dissertations-theses/qualitative-study-middle-school-teachers/docview/3200020276/se-2>
- Jenson, R.J., Lee, M.S., Day, A.D., Hughes, A.E., Maroushek, E E., & Roberts, K.D. (2023). Effective inclusion practices for neurodiverse children and adolescents in informal STEM learning: A systematic review protocol. *Systematic Reviews*, 12, 1-8. doi: <https://doi.org/10.1186/s13643-023-02278-2>
- Jenson, R.J., Lee, M., Vollmer, A.R., Maroushek, E.E., & Hughes, A.E. (2024). Exploring programmatic elements that foster neurodiverse children and adolescents' participation in informal STEM learning programs: A systematic review. *Disciplinary and Interdisciplinary Science Education Research*, 6(1), 22. doi: <https://doi.org/10.1186/s43031-024-00113-9>
- Lucie, M. D. (2024). Redefining the right to quality education for autistic children through a neurodiverse perspective. *Scandinavian Journal of Disability Research: SJDR*, 26(1), 366-379. doi: <https://doi.org/10.16993/sjdr.1043>
- McHugh, S.V. (2024). *Relationship interventions for autistic children and their non-autistic siblings* (Order No. 31631711). Available From ProQuest One Academic. (3116105256). Retrieved from <https://www.proquest.com/dissertations-theses/relationship-interventions-autistic-children/docview/3116105256/se-2>
- Mpolomoka, D.L. (2024). Research Ethics in Post-Graduate Education: A Meta-Analysis. *Journal of Education and Practice*, 15(13), 26-33 <https://doi.org/10.7176/JEP/15-13-02>

- Mpolomoka, D.L., Muvombo, M., Chikopela, R., Chansa, C.T., Marirajan, T. and Gondwe, C. (2024). Contemporary Trends in Socialization: Benefits for Children with Special Education Needs, Zambia. *Open Access Library Journal*, *11*, 1-18. <https://doi.org/10.4236/oalib.1112062>.
- Mushibwe, P.C., Mpolomoka, D.L., Botha, N. & Machaka, B. (2020). Emotional intelligence of secondary school headteachers and school achievement: A case study of Kasenengwa District. *Zambia Interdisciplinary Journal of Education*, *1*(1), 55-97. <https://doi.org/10.12345/zije.2020.01105>
- Muvombo, M., Musonda, A., Mpolomoka, D.L., Banda, S., Sampa, R.L. and Chalwe, A.N. (2024a). Nurturing Parental Involvement in Artificial Intelligence (AI) Literacy among Children in Multicultural Classrooms. *Journal of Culture, Society and Development*, *73*, 72-83. <https://doi.org/10.7176/JCSD/7307>
- Muvombo, M., Mpolomoka, D.L., Mainde, D., Chanda, T.C., Thiruppathi Marirajan, Kabundula, P.K. (2024b). Socializing Persons with Disabilities: Tracing Changes-In-Time. *Journal of Education and Practice*, *15*(9), 26-33 <https://doi.org/10.7176/JEP/15-9-04>
- Ngambi, S.N., Kabika, M.N., Moonga, A.L.H., Chikopela, R., Moonga, M.S. & Mpolomoka, D.L. (2020). Co-curriculum responsiveness for adaptability and challenges for teachers in hard-to-live areas of Mkushi and Luano districts, Zambia. *Zambian Journal of Educational Management, Administration and Leadership (ZJEMAL)*, *1*(1), 71-86. <https://doi.org/10.12345/zjemal.2020.01105>
- Payano, M.L. (2024). *Teachers perceptions on technology as a tool to support neurodiverse students* (Order No. 31490435). Available From ProQuest One Academic. (3089732169). Retrieved from <https://www.proquest.com/dissertations-theses/teachers-perceptions-on-technology-as-tool/docview/3089732169/se-2>
- Rose, D.H., Meyer, A. & Gordon, D. (2015). *Universal Design for Learning: Theory and Practice*. CAST Professional Publishing. Retrieved from [https://www.researchgate.net/publication/276267753\\_Universal\\_Design\\_for\\_Learning\\_Theory\\_and\\_practice](https://www.researchgate.net/publication/276267753_Universal_Design_for_Learning_Theory_and_practice)
- Saldaña, S.C. (2024). *Beliefs of Arizona school-based agricultural education teachers on neurodivergent students within FFA intracurricular programs: A multiple case study analysis* (Order No. 31487412). Available From ProQuest One Academic. (3188689179). Retrieved from <https://www.proquest.com/dissertations-theses/beliefs-arizona-school-based-agricultural/docview/3188689179/se-2>
- Salvatore, S., White, C. & Podowitz-Thomas, S. (2024). "Not a cookie cutter situation": How neurodivergent students experience group work in their STEM courses. *International Journal of STEM Education*, *11*(1), 47. doi: <https://doi.org/10.1186/s40594-024-00508-0>
- Seligman, M., & Darling, R.B. (2017). *Ordinary Families, Special Children: A Systems Approach to Childhood Disability*. Guilford Press. Retrieved from [https://www.guilford.com/books/Ordinary-Families-Special-Children/Seligman-Darling/9781606233177?srsId=AfmBOop\\_q-oAbrBfxYpMdXzCrGk41TZPFK2MWHkiCnMFUYoGZFDSTuMR](https://www.guilford.com/books/Ordinary-Families-Special-Children/Seligman-Darling/9781606233177?srsId=AfmBOop_q-oAbrBfxYpMdXzCrGk41TZPFK2MWHkiCnMFUYoGZFDSTuMR)

- Singer, E. (2016). The Teacher-Child Relationship in Early Childhood Education: A Cross-Cultural Perspective. *Journal of Research in Childhood Education*. DOI: 10.1080/02568543.2016.1147751
- Smith, J.A., Flowers, P., & Larkin, M. (2012). *Interpretative Phenomenological Analysis: Theory, Method, and Research*. Thousand Oaks: SAGE Publications. DOI: 10.4135/9781446213730
- Snow, C.J. (2025). *Making inclusion meaningful for preschool children with severe autism* (Order No. 32001355). Available From ProQuest One Academic. (3200087077). Retrieved from <https://www.proquest.com/dissertations-theses/making-inclusion-meaningful-preschool-children/docview/3200087077/se-2>
- Snyder, P., Hemmeter, M. L., & McLaughlin, T. (2021). Implementing Multi-Tiered Systems of Support for Young Children: Aligning Systems for Success. *Journal of Early Childhood Education*. DOI: 10.1007/s10643-021-01199-z
- Tomasello, M. (2019). *Becoming Human: A Theory of Ontogeny*. Harvard University Press. <https://doi.org/10.4159/9780674988651>
- Volkmar, F.R., Rogers, S.J., & Paul, R. (2021). *Handbook of Autism and Pervasive Developmental Disorders*. Wiley Online Library. <http://dx.doi.org/10.1017/9781108297769>
- Williams, T.D. (2024). *Examining the impact of a professional learning community on teachers' awareness of neurodiversity in the classroom* (Order No. 30994760). Available From ProQuest One Academic. (3093726967). Retrieved from <https://www.proquest.com/dissertations-theses/examining-impact-professional-learning-community/docview/3093726967/se-2>

Creative Commons licensing terms

Author(s) will retain the copyright of their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Public Health Studies shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflicts of interest, copyright violations and inappropriate or inaccurate use of any kind content related or integrated into the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a [Creative Commons Attribution 4.0 International License \(CC BY 4.0\)](#).