

Article

Reconceptualizing Inclusive Education for Children with Autism: A Case-Based Analysis of Family–School–Community Dynamics

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Abstract: Inclusive education for children with autism has increasingly been implemented in mainstream schools, but its implementation is uneven and situational. Children with autism commonly face ongoing challenges in classroom communication, participation and adjustment in large, data-rich learning environments. These challenges call for deeper understandings about how inclusive education takes place in everyday education practices. This article considers autism-inclusive education as a dynamic process enacted through family–school–community processes. Focusing on real educational situations, this study uses a case-based approach to examine how inclusive processes emerge, develop and endure over time. Rather than seeing inclusion as a labelling decision about who attends a school, this analysis centres the relational processes that shape the learning experiences of autistic children. These findings suggest several factors that are necessary for effective inclusion: ongoing parental engagement and advocacy, teachers’ understandings of autism and adjustments in teaching practices, and access to community-based resources for beyond-the-classroom learning. Communication and classroom participation appear to be central places for both fostering and hindering inclusion. By exploring the various interdependent factors that occur together, this study also presents a conceptual understanding of autism-inclusive education that stems from practice and is relevant to other discussions of inclusive education.

Keywords: Autism Spectrum Disorder; Inclusive Education; Case-Based Analysis; Family–School Collaboration; Educational Ecology

1. Introduction

Inclusive education has become one of the principal guiding strands of global education reforms that seek to advance equality and social participation of children with disabilities. As inclusive policies expand, access to mainstream schools has improved greatly, although the effectiveness of inclusion varies across different disability groups. Among them, inclusion remains particularly challenging for children with Autism Spectrum Disorder (ASD), because of the complex challenges associated with communication difficulties, social interaction barriers, and context-dependent behavioral variability. For this reason, the gap between the inclusive education policies’ aspirations and classroom reality is particularly pronounced in the context of autism education.

Autistic students in mainstream education frequently face structural and pedagogical barriers that limit their meaningful involvement. Large class sizes, general curricula, and lack of training in special needs teaching limit access to individualized support. As a result, inclusion frequently becomes nominal rather than substantive, characterized by physical placement without appropriate teaching adaptations. Empirical studies show that many autistic

students cannot become involved in classroom communication or interaction and end up socially withdrawn, with poor learning outcomes even though they attend mainstream classrooms [1]. This pattern is not specific to any single national system: international systematic reviews report the same dissociation between placement and participation, with autistic pupils often gaining physical access while reciprocal friendship and a felt sense of belonging lag behind [2]. Rather than locating this gap as a deficit within the individual child, recent scholarship, working within a neurodiversity paradigm, reframes it as a relational mismatch—the “double empathy problem,” in which autistic and non-autistic actors each find the other difficult to interpret [3,4]—shifting the analytic focus from remediating the student toward redesigning the communicative environment. All this indicates the need to go beyond policy assessments to a closer monitoring of how inclusive education is experienced on the ground.

Classical views on inclusive education have foregrounded inclusion as a placement issue. They focus on whether students with disabilities have the opportunity to enter mainstream schools. Recent scholarship, however, increasingly conceives of inclusion as an unfolding, relational process influenced by various stakeholder interactions. From this view, the educational outcome of inclusion depends not just on school placement, but also on the quality of relationships across families, teachers, peers, and community support systems. Lack of coordinated joint efforts from these stakeholder groups results in the confusion in inclusive placements in which students may be physically present but educationally excluded [5].

Communication has a particularly central role in this relational model. It is the main vehicle for the educational expectations, emotional investments, and collaborative strategies negotiated across stakeholders; when communication channels between families and schools break down, inclusive education cannot address students’ individualized needs. There have been several forms of communication breakdown found in research, such as informational asymmetry between parents and teachers, emotional mistrust created by disparity of expectations, and broken coordination across institutional boundaries [5,6]. Communication breakdowns usually lead to imperfect matching of the available resources with students’ developmental needs and degrade inclusive outcomes.

Among all stakeholders involved in inclusive education, families have an important, distinct role in the education of autistic children. Autism requires sustained intervention across multiple contexts, including home, school, and community environments. For this reason, parents are, in many cases, providers of care, as well as active participants in the interventions offered in educational settings. Multiple studies have consistently shown that robust family involvement is associated with better communication skills, adaptive functioning, and emotional regulation among children with disabilities [7]. In addition, in autism education, parents often act as co-interventionists who reinforce instructional support at home and other daily life situations, extending the opportunities for autistic child learning outside of the school context.

Despite its significance, family participation in inclusive education is often constrained by structural and psychosocial challenges. Families of autistic children often suffer from heavy caregiving burdens, financial pressures, and psychological stress, which inhibits their sustained involvement in inclusive education. Meanwhile, many educators do not have training in collaborative communication skills, leading to interactions that remain informational rather than wholly cooperative [5,8]. Such challenges highlight that inclusive education cannot be adequately characterized as a school-centred initiative but instead needs to be characterized as a multi-system collaboration process.

An ecological perspective helps identify these complexities. The ecological perspective interprets inclusive education as an evolving system constructed out of actions at different individual, interpersonal, institutional, societal levels. Within such a framework, successful inclusion depends on the alignment of informational coordination, emotional trust, and collaboration among stakeholders. If these dimensions work together in a coordinated and integrated fashion, they produce an enabling environment that allows autistic students to participate in mainstream education in a full and meaningful way. When any of these dimensions get fragmented, inclusive practice in education may dissolve into tokenism and superficial participation [6,8].

Building on this ecological standpoint, the present study investigates autism-inclusive education as a relational and context-dependent process. Rather than examining institutionally documented policies and interventions in the education of people with autism, it focuses on how inclusive practices are produced and operate as part of continuous interactions among families, schools, and community support systems. By examining inclusion as a dynamic process embedded in everyday educational contexts, this study seeks to develop a practice-grounded account of autism-inclusive education and to identify the relational resources that make effective inclusion possible.

Internationally, autism-inclusive education has been advanced through systematically catalogued evidence-based practices [9], while recent high-impact reviews continue to document a persistent gap between physical placement and genuine belonging for autistic students [2]. These literatures, however, remain largely siloed: intervention science specifies which practices work, whereas ecological and relational accounts explain why the same practices yield uneven outcomes across settings, and the two are seldom integrated within a single empirical case. The present study addresses this gap. Its contribution is threefold. First, it reframes autism inclusion as a multi-level coordination process rather than a placement decision. Second, it empirically links micro-level multimodal communication, meso-level family-school synchronization, and macro-level institutional governance within concrete, situated cases. Third, it offers a practice-grounded and transferable account of the relational resources that sustain inclusion over time, thereby connecting international intervention frameworks with the everyday ecology in which they must operate.

This focus also clarifies the study's relevance to research on communication and language intervention. Communication and social participation are not background concerns here but the central outcomes at stake: for autistic children, the barriers to inclusion are predominantly communicative, and the mechanisms examined in this study describe the relational ecology within which communicative competence is supported, language use is elicited, and communication-focused interventions are delivered, sustained, and generalized. Naturalistic, communication-oriented interventions are known to depend on natural settings, caregiver involvement, and generalization across home, school, and community [10]—precisely the conditions this study analyses. By specifying how family, school, and community coordinate to stabilize communication and to maintain support over time, the study connects ecological accounts of inclusion to the assessment- and rehabilitation-oriented concerns of communication-intervention research, offering a framework within which clinic- and classroom-based language and communication supports can take hold in everyday life.

2. Literature Review

2.1. Evolution and Conceptual Transformation of Inclusive Education

Over the past few decades, the concept of inclusive education has transformed itself from a narrow focus on physical placement toward a broader understanding of participation, active involvement and support system. Early studies on inclusion tended to see inclusion as a concern of educational justice and access, promoting the legal and social right of children with disabilities to attend a mainstream school. Within this view, success of inclusive education was assessed in terms of enrolment rather than quality of the experience for students [11]. Although the rights perspective was very important in demolishing segregated education structures, it also missed the complexity involved in sustaining active participation within inclusive education.

Subsequent research started to bridge this gap by examining the instructional and organizational aspect of inclusion. Researchers were increasingly focusing on teacher preparedness, classroom adaptation and resource provisioning for inclusion. Research had shown that for inclusive education to be effective, it heavily depends on teachers' professional preparedness, including their ability to deal with different learning needs and provide effective differentiated teaching approaches [11]. Two complementary bodies of work have responded to this challenge. Universal Design for Learning (UDL) reframes adaptation as proactive curriculum design rather than retrofitted accommodation, providing multiple means of engagement, representation, and action and expression so that learner variability is anticipated from the outset. In parallel, syntheses of evidence-based practices for autistic learners—including visual supports, structured work systems, prompting, and naturalistic intervention—offer an empirically vetted repertoire for use within inclusive classrooms [9]. These frameworks suggest that teacher preparedness is less a matter of mastering any single technique than of coordinating a flexible, design-led repertoire to the specific communicative ecology of a given classroom. Yet, this line of research also highlighted the hardships like insufficient training for teachers and limited institutional support, and uneven distribution of resources among schools. This, in turn, illuminated how inadequate it was to treat inclusion as a structural reform issue and to challenge the study of the everyday of implementation of inclusive education.

More recent studies have continued to broaden the conceptual coverage of inclusive education by incorporating ecological and relational approaches. From this perspective, inclusion is no longer seen as a static set-up of institutions or arrangements but as a dynamic process influenced by actors such as families, teachers, and broader

support systems. Ferguson [12] has claimed that moving from the segregated to the inclusive education also signifies a shift not only in location but also in education philosophy, and it is a constant negotiation at the institutional level. Research has also pointed out that meaningful inclusion is about incorporating social, emotional and communication dimensions of participation, rather than mere academic access.

Within this changing landscape of theory, autism offers especially complicated challenges that further complicate inclusive education. Autism features substantial differences in communication styles, social interaction and sensory processing which may conflict with classroom norms. For autistic students, the barriers are not that of a typical cognitive impairment, but of the mismatch between their specific communicative needs and the standard ways of conducting education [13]. This relational reading of barriers resonates with and sharpens Milton's [3] double empathy account, which locates breakdown in the bidirectional gap between autistic and non-autistic interpretive frames rather than in the child alone. These studies imply that inclusive education for autistic children and students cannot be understood as placement approaches alone, but may call for an additional understanding of relational dynamics and communicative practices.

Furthermore, research helps to highlight the need to distinguish between physical integration and true participation. Many autistic students may enroll in mainstream classrooms, their social interaction and collaborative learning therein is still limited. This gap reflects the broader theoretical shift in inclusive education from focusing on access to emphasizing participation, belonging, and engagement. Such a shift required inclusive education as an ecological construct that involves interactions across the ecology of home, school and communities, and not as a single institutional intervention.

2.2. Collaborative Mechanisms and Systemic Challenges in Autism Inclusion

Among the various factors affecting inclusive education, family-school collaboration is among the most important factors for positive outcomes for children with disabilities. Research clearly shows that the family has its own knowledge regarding children's learning requirements, their ability to communicate, behaviour, and so forth, making them unique partners for consultation about educational interventions [14]. In the context of autism, family involvement is even more important, given the need for reliability and stability in different settings and contexts. Collaboration helps to synchronize intervention plans in home and school settings to facilitate consistency in learning and behavioural support.

Nevertheless, despite its acknowledged importance, there are many challenges when implementing family-school collaboration. Many family-school collaborative practices are superficial and stop at one-way communication of information rather than partnership. Hodge and Runswick-Cole [8] recognize structural inequalities of power in the relation between teachers and parents as a major challenge and find that usually communication is teacher-driven and not a shared collaboration; misunderstandings result, parental involvement and trust for all involved are reduced.

Additional research speaks to teachers' professional and emotional competencies affecting collaboration. Teachers with higher social-emotional competence are more likely to engage in proactive communication and form supportive relationships with families [15]. Teachers' insufficient training in collaborative skills also leads to inconsistent and fragmented communication and intervention efforts. Such findings emphasize the need to view collaboration not just as a procedural matter but a relational process of continuous negotiation and adjustment.

Factors about schools in a systemic and institutional way are also very important in determining inclusive education outcomes. Resource classrooms, resource teacher teams, district level support are certain systemic structures that contribute to school inclusive practices. These structures offer professionalism support, technical support and coordination in organizing support for children and youth with diverse learning needs [16]. Yet, the role of these support infrastructures is also highly constrained by disparities in resource allocations, limited professional development opportunities, and mismatched coordination among stakeholders.

Moreover, the shifting role of special education institutions mirrors broader systemic change in inclusive education. For a long time, special education institutions played a segregated role. However, nowadays they are increasingly expected to act as support centres, providing expertise and training to mainstream schools. Norwich [17] notes that this is an important move towards integration, but also raises new problems concerning role shifting and capacity building.

Despite these advances, important gaps remain in the research. Existing research tends either to focus on

structural policy concerns or to be concerned with discrete strategy and intervention approaches; other issues that might be involved in how inclusion is accomplished as part of everyday practices are largely overlooked. Moreover, while family-school collaboration is acknowledged as important, research often conceives of it as a fixed institutional entity and rather than as an ecological process defined by means of communication, trust and emotions.

These gaps suggest that a reconceptualization of autism-inclusive education is required that brings to bear ecological perspectives, dynamics of communication and frameworks of collaboration. This would offer an overall sense of how inclusive practices develop as continual interactions between key stakeholders unfold, and it would suggest routes to turning inclusion from an educational ideal to a lived experience.

3. Theoretical Framework

Inclusive education for children with autism has gradually moved from a placement-centric policy concept to a more dynamic process of inclusion driven by ongoing interactions among individuals, institutions, and social systems. Research to date consistently points to the fact that inclusion outcomes cannot be fully understood in terms of the impairments of individuals or classroom level pedagogy. Rather, they are dynamic and related to ongoing coordination along the communicative, relational and systemic dimensions of family-school-community interactions [2,18]. Drawing on these understandings, the present study presents a unified and comprehensive framework that integrates sociocultural interaction theory, ecological systems theory, and collaborative partnership perspectives to explain how inclusive education is constructed co-actively across interconnecting contexts.

At the micro level, sociocultural interaction theory provides a basic framework for understanding inclusion as a process of meaning negotiation embedded in everyday communication. According to sociocultural theory, learning and development are mediated through social interaction and symbolic tools, rather than occurring in isolation [19]. Research on autism inclusion identifies participation barriers as arising from mismatches between the manner of autistic communication and the implicit social norms of so-called mainstream classrooms [13]. Studies consistently show that when teachers use multimodal scaffolds of instruction, such as visual cues, structured routines, explicit cues for communication, autistic students become more engaged, show greater social reciprocity, and participate more consistently in classroom routines. Conversely, highly implicit and verbal instruction environments frequently intensify exclusion despite formal inclusion placement. These findings suggest that inclusion fundamentally consists in the co-construction of shared meanings, where communicative practices function as mediating mechanisms connecting individual abilities with opportunities for social participation.

While sociocultural interaction theory delineates micro-level dynamics, ecological systems theory offers a broader, structural context for understanding how inclusive education is affected by multiple interacting social systems. Bronfenbrenner's ecological model of child development conceptualizes child development as taking place within several nested systems that include the family, school, community, and so on [20]. The literature we reviewed indicates that inclusive education outcomes are very much shaped by how mutually supporting these different systems are. More effective inclusion is likely when families and schools communicate mutually, have mutual educational expectations, and coordinate educational interventions. By contrast, systemic incoherence (such as limited parental involvement, limited resources from the institutions, or incoherent educational practices) most frequently results in incoherence of interventions and a loss of trust between different participants in this system. Ecologically, inclusion is not an instruction alone but a systemic condition that entails the social relational landscape among various social contexts.

Beyond systemic alignment, collaborative partnership theory identifies important governance models required to maintain sustained alignment of stakeholders over the long term. Studies of family-school-community collaboration paint a picture of inclusive education premised on shared agency, shared decision-making, and institutionalized communication structures [21]. Studies reveal that schools that establish supportive multiple disciplinary teams, collaborative planning structures and frequent consultation and advisory spaces tend to report greater trust and collective efficacy among school stakeholders. Such collaborative arrangements enable stakeholders to coordinate intervention actions, to agree on joint objectives and to manage challenges using cooperative rather than hierarchical approaches to control. In fact, collaboration is more than an organizational structure; it is also a relational process by which stakeholders generate shared understandings of inclusion, disability, and educational success [14].

Despite their explanatory strengths, these theoretical perspectives often remain fragmented. Sociocultural

approaches are based mostly on classroom-level interaction. Ecological models emphasize systemic structures. Collaboration frameworks address governance processes. Few studies draw these perspectives together to explain how communication mechanisms can link to relational and institutional coordination across different levels [2]. This theoretical gap is especially apparent in studies of autism inclusion, where differences in communicative processes fundamentally shape the experience of participation in different settings.

To address this limitation, the present study proposes a multi-level symbolic coordination framework for inclusive education (**Figure 1**). At the micro-level, inclusion arises from multimodal communication that provides opportunities for mutual meaning-making and participation. At the meso level, relational coordination among families, schools, and community organizations distributes resources and maintains continuity across environments. At the macro level, collaborative governance structures establish institutional conditions capable of regulating all stakeholders, facilitating information sharing, and maintaining ongoing coordination. These levels are interconnected dynamically: more successful relational interaction improves relational trust, more relational alignment increases the potential of governance, and stronger institutional coordination ensures inclusive practice.

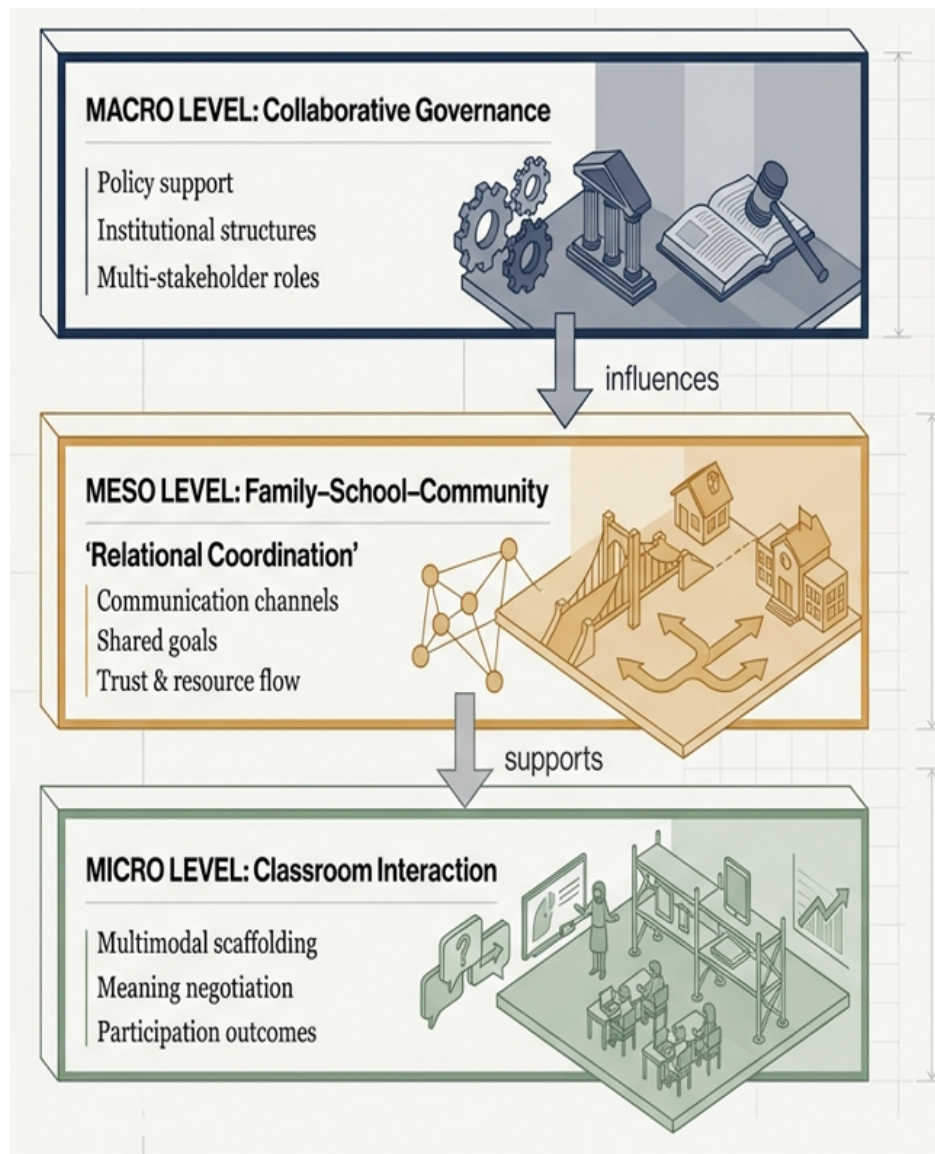


Figure 1. Three Levels of the Supportive Ecosystem.

Integrating sociocultural, ecological and collaborative perspectives, this framework reconceptualizes inclusive

education for children with autism as the emergent process of ongoing symbolic and relational coordination rather than a static product of policy arrangements. It offers a comprehensive analytical lens for examining how inclusive outcomes emerge through continuous negotiation among diverse actors embedded within interconnected social systems.

These three traditions are complementary rather than competing, and the framework integrates them by assigning each a distinct but interlocking level of explanation. Vygotskian sociocultural theory accounts for the micro level, at which meaning and competence are co-constructed through mediated, multimodal interaction; Bronfenbrenner's bioecological theory accounts for how these micro-interactions are nested within, and shaped by, the family, school, and community systems that surround the child; and Epstein's model of overlapping spheres of influence specifies the collaborative governance through which those systems are coordinated over time. Read together, they describe one phenomenon viewed at different scales—the relational coordination that makes participation possible—rather than three separate accounts. This integration directly shaped the study's design and analysis: because each tradition foregrounds a different level, data were gathered across all three (interactional records, cross-context relational accounts, and institutional arrangements), and the analysis deliberately traced how processes at one level enabled or constrained those at another. The four mechanisms reported below—interactional stabilization, relational synchronization, structural continuity, and ecological extension—correspond respectively to the sociocultural, relational, collaborative-governance, and ecological strands of the framework, making the link between theory and findings explicit.

4. Methodology

4.1. Research Design and Epistemological Positioning

This study adopts a qualitative interpretive case study design to examine how inclusive education for children with autism is dynamically constructed through interactions among family, school, and community actors. The interpretive paradigm is particularly suited to this research because inclusive education is not simply an institutional arrangement but a social process that involves situated meaning-making, adaptation, and symbolic coordination in everyday educational practice.

From an interpretive perspective, educational participation is understood as socially constructed through interaction rather than determined solely by structural placement or policy frameworks. For autistic students, inclusion always involves a lifelong negotiation of communicative expectations, emotional alignment, and relational trust across multiple social contexts. Such negotiation processes cannot be fully captured by quantitative measures alone, because they emerge from subtle interactional processes enacted in specific educational contexts.

A qualitative case study approach is hence also methodologically appropriate to shed light on these complex relational phenomena. Case study research facilitates a close examination of contextually located processes and allows researchers to explore contemporary social phenomena within their real-life settings [22]. In contrast to large scale survey research, case studies aim towards a comprehensive understanding of individual actions and relationships, and their contextual influence on learning experiences.

Furthermore, the tradition of interpretive case studies puts special weight on meaning as a co-construction of participants and their environment [23]. This characteristic fits closely to the study's theoretical framework, in which we understand inclusive education as a multi-level coordination process, unfolding at micro-level communicative activity, meso-level communicative collaboration and macro-level systemic support. Thus, the research design focuses less on describing case events than on uncovering the interactional processes by which inclusion occurs and unfolds over time.

4.2. Case Selection and Context

The study uses purposive sampling to select two cases of inclusive education with autistic students in mainstream classrooms as representatives. Purposive case selection is appropriate in qualitative research when it aims to produce analytical insights rather than statistical generalization [24]. The cases selected provide rich empirical material that illustrates how inclusive participation is negotiated across different types of relational and ecological contexts.

The first case focuses primarily on family-school collaboration in supporting a child's classroom engagement.

It documents the processes through which teachers and parents jointly adjusted communication strategies, behavioral supports, and instructional expectations to facilitate the student's participation. This case offers rich insights into the micro-interactional adjustments and meso-relational negotiations that support inclusive practice.

The second case illustrates a wider support network of families, teachers, community organizations, and professional support services. It explains how inclusive education can continue to be realized through mobilizing resources and coordinating across institutions and contexts. This case therefore also reflects a more systemic form of inclusion, and how macro-level ecological supports contribute to participation in education.

Together, the two cases form a complementary pair of cases for analysis. The first case highlights relational coordination within the immediate educational context, whereas the second case signals how inclusion can be embedded in wider ecological systems. This two-case design allows for cross-case comparison and increases analytical potential by identifying persistent interaction patterns across different kinds of contexts.

Each case was treated as a bounded system rather than as an individual child. The unit of analysis was the focal autistic student together with the network of people and arrangements that supported that student's participation over the study period—in Case 1, the student, the parents, and the class and resource teachers within a single mainstream classroom and its associated home-school routines; in Case 2, the same core plus the community organizations and practitioners involved in the student's wider participation. Temporally, each case was bounded by the period over which support was documented (approximately one academic year), and contextually by the settings in which participation was observed. Interactions, relationships, or arrangements falling outside this network and period were treated as context rather than as case data. Defining the cases in this way keeps the analytic focus on the relational ecology of inclusion and clarifies what counts as evidence within each case.

4.3. Data Sources and Materials

Data for this study are drawn entirely from detailed case documentation records that contain narratives, observations, interaction transcripts, pictures and photographs. These records contain abundant evidence of various educational practices, communicative processes, and environmental adaptations in inclusive classrooms.

The textual data are descriptive narratives about classroom interactions, parent-school communication conversations and various interventions to aid autistic students. Such narratives register both typical kinds of educational practices and significant kinds of interactional moments in which communicative challenges arose and adaptation responses were negotiated.

In addition to textual materials, the study also includes visual data in the form of images that depict classroom settings, interaction settings, and environmental adaptations. Visual materials are crucial empirical data because they offer direct evidence of physical environments, symbolic supports for communicative actions and embodied interaction practices that may not be fully communicated in written texts.

Integration of text and visual data also demonstrates a multimodal understanding of social interaction, where meaning-making activity is constructed through multiple semiotic modes rather than predominantly through talk [25]. Treating visual material as one source of evidence enables this study to capture the ecological and embodied dimensions of inclusive education that textual data alone can often miss.

4.4. Analytical Procedures

Data analysis followed a thematic, interpretive design intended to develop knowledge about the interactional processes entailed in inclusive education practices. The analysis proceeded in cycles of coding, interpretation, and cross-case comparison.

The first stage of analysis was an in-depth familiarization with all text and visual data. Detailed readings of case narratives allowed for the identification of central interactional events, relational negotiation and environmental adaptation of students' access to education. Visual data was analyzed at the same time to contextualize, mobilize and compare textual descriptions.

In the second stage, initial codes were generated by working line-by-line through the textual and visual records, labelling segments that captured how communication, relationships, or institutional arrangements shaped participation. This open coding produced a descriptive codebook with codes such as "slowing turn-taking," "visual scheduling," "parent-teacher information sharing," "renegotiating support after a setback," and "handover at a change of teacher." Codes were then compared, merged, and clustered into candidate themes that grouped conceptually

related patterns. Theme development was abductive: inductively derived codes were read against the study's three theoretical dimensions—communicative alignment, relational negotiation, and systemic support—so that the emerging themes were both grounded in the data and theoretically coherent. Coding decisions, the evolving codebook, and the candidate themes were reviewed collaboratively by the research team; discrepancies were discussed until consensus was reached, and theme definitions were refined accordingly. This process yielded the four cross-level mechanisms reported in the Findings.

The third stage involved cross-case comparison. Following the candidate themes within each case, the two cases were placed side by side to ask three questions in turn: where did the same mechanism appear in both cases (similarities), how did each case enact that mechanism differently given its scope and resources (differences), and what patterns recurred across the contrast (emerging patterns)? This comparison treated the cases not as two separate narratives but as paired instances through which underlying coordination mechanisms—operating across the micro, meso, and macro levels of the framework—could be identified and tested for transferability beyond either individual case.

4.5. Visual Data Analysis Strategy

Visual materials were analyzed as important sources of empirical evidence rather than ornamental add-ons. Where visual materials were analyzed, the analytical focus was on how they reflected organization of space, communicative supports, and environmental adaptations that enable inclusive participation.

Particular attention was paid to three aspects of visual data: the organization of physical space, the presence of symbolic communication supports, and the positioning of interactional actors. Such visual features were interpreted in the light of corresponding textual descriptions to construct a sense of the interactional context in which inclusive practices were enacted.

This multimodal analysis approach reflects how communication in inclusive classrooms is embodied and situated. Spatial arrangements, material supports, and visual cues play crucial roles in fostering accessibility and emotional regulation for autistic learners. Visual data thus offers important insights into the ecological context that enable or hinder inclusive participation.

4.6. Trustworthiness and Ethical Considerations

Further to assure the authenticity and trustworthiness of the findings, the study employed several strategies to pursue analytical credibility. Data triangulation was done through interweaving of textual narrations and visual accounts, providing validation to each other. Iterative coding procedure also helped analyse categories and reduce subjectivity.

To make these procedures more transparent, several measures are specified here against the criteria of credibility, dependability, and confirmability. Coding was conducted collaboratively rather than by a single analyst: a subset of records was independently coded by more than one member of the research team, and coding discrepancies were resolved through discussion (peer debriefing) until consensus was reached. The evolving codebook was retained as an audit trail documenting how codes and themes developed, supporting the dependability of the analysis, while confirmability was pursued through ongoing reflexivity regarding the researchers' assumptions about autism and inclusion. The data were collected and prepared by members of the research team familiar with the settings, and, where feasible, provisional interpretations were checked informally against participants' own understandings (member checking). The corpus comprised the full set of records accumulated over the documented period for each case; the exact volume of data—the number of observations, transcripts, and images—should be reported in the final manuscript.

Because this is an interpretive study, the analysis has considered the researcher's role in creating meaning from empirical materials. Interpretations were therefore consistently grounded in empirical documented evidence rather than subjective imagination.

Ethical concerns were also taken seriously, and in this study these were ensured by using only anonymised case material in which all personal identifiers were removed. The analysis focuses on educational processes instead of individual characteristics, with participants' modesty and privacy fully respected.

This study did not involve any prospective or experimental intervention. The case material consisted of records compiled by the classroom and special-education teachers in the course of their routine educational practice. The

children's parents or legal guardians were informed about the research use of these records, and all personal identifiers were removed prior to analysis, so that the study reports on educational processes rather than on identifiable individuals. No photographs in which participants are identifiable are reproduced in this article, and the figures presented are author-constructed conceptual diagrams. Because the material originated as routine educational documentation rather than as a prospective research project, it was not submitted for formal research-ethics-committee review; the work was nonetheless carried out in accordance with the ethical principles of the Declaration of Helsinki, with participant privacy and confidentiality protected throughout.

5. Findings

The analysis identified four interrelated mechanisms through which participation was achieved and sustained; each is defined here and then elaborated, with supporting evidence, in the subsections that follow. Interactional stabilization refers to the moment-to-moment work of making classroom communication predictable and manageable through multimodal scaffolds such as pacing, visual supports, and gesture; it extends Vygotskian notions of mediation and scaffolding [19] and is consistent with naturalistic, communication-focused intervention practice [10]. Relational synchronization denotes the continuous alignment of understanding among family and school—and, in Case 2, community—actors through trust-based, reciprocal communication, building on research on parent–teacher communication in autism [18]. Structural continuity refers to the institutionalized routines, such as plans, reviews, and defined roles, that keep support coherent across time, personnel, and settings, in line with implementation-science accounts of sustaining evidence-based practice [26]. Ecological extension refers to the deliberate carrying of classroom gains into prepared participation in wider community contexts [20]. Crucially, these constructs were derived inductively from the coded data rather than imposed in advance: each was abstracted from recurring patterns in the records and only then related to existing theory, as detailed in Section 4.4.

5.1. Interactional Stabilization: Multimodal Regulation of Classroom Participation

Analysis at the interactional level suggests that sustained classroom participation for autistic students did not result from the communicative competence of individual students alone, but from stability of interactional environments. For both cases, participation was unstable, rising and falling strongly in relation to the way communication demands were framed and managed within classroom routines.

A central mechanism identified in the analysis is what may be termed interactional stabilization. It refers to the continuous matching of the dynamics of communication by multimodal scaffolding mechanisms, including visual cues, gesture signalling and physical layout of the learning environment. These were not simply aids but part of the interactional structure that helped students keep up with ongoing classroom interaction.

Teachers constantly adjusted their communicative pace to match students' processing features. Instead of giving fast verbal instructions, they used slower turn-taking sequences, repeated multimodal cues, and stable instructional patterns. Such adjustments eased the cognitive load in the task of online language comprehension and enabled students to remain engaged, without feeling overburdened by communicative interactions.

A representative observation from Case 1 illustrates this mechanism. During a mathematics lesson, the focal student disengaged when the teacher moved abruptly from a worked example to rapid oral questioning, stopping his responses and looking away. The teacher paused, placed the next step on a small visual card, and re-presented the question more slowly while gesturing toward the card; within the same exchange the student re-oriented and completed the task. The case record, documenting a laminated step-by-step card beside the workbook, evidences the material support that rendered the verbal demand predictable. The breakdown thus coincided not with the difficulty of the question but with the pace at which it was delivered; once pacing and the visual marker were restored, participation resumed without further prompting.

Importantly, the findings indicate that breaks in participation typically did not occur because students were incapable of communicative actions, but because interactional contexts became temporally unstable. Sudden instructional changes, compressed verbal instructions, or unexpected changes in classroom routine could immediately lead to disengagement. With multimodal scaffolding back in place, participation levels were quickly restored. Thus, inclusion at the level of micro-interaction is ultimately based on regulating communicative environments and not on treating individual skills as the problem.

This interactional perspective portrays inclusion as an emergent property of structured communicative systems. Classroom participation is sustained when interactional demands are stabilized through multimodal alignment, allowing students to keep track of their communicative timing in the classroom.

5.2. Relational Synchronization: The Dynamics of Family–School Alignment

At the relational level, the findings demonstrate that inclusion sustainability was considerably dependent on how well families and the school participants synchronized with one another. This synchronicity went beyond routine communication, and also entailed the ongoing co-construction of interpretive frameworks regarding students' behaviors, needs, and support strategies.

In both cases, successful inclusion was tied to having relational systems for regular circulation of observations and adaptations. These enabled stakeholders to co-construct shared understandings of students' communicative patterns, emotional triggers, and effective support approaches. Such shared interpretive alignment significantly reduced discrepancies between home and school.

Relational synchronization also played an important role in regulating uncertainty. Supporting students with autism often involved dealing with unpredictable behavioural reactions and varying degrees of engagement. When families and teachers maintained high levels of trust and open communication, they were able to routinely renegotiate support strategies in response to new and unexpected challenges. This flexibility was important for preventing small problems from turning into long-standing breakdowns in participation.

When communication routines became relatively loose or trust was lacking, support efforts were fragmented. Teachers did not have the contextual information held in families' mindsets, whereas parents were uncertain about expectations in classroom settings. Such mismatch was often a result of untimely and desynchronized support that would undermine stability in participation.

This dynamic was visible in the home–school communication used in Case 1. A shared daily notebook circulated between the class teacher and the parents, recording brief observations about the student's mood on arrival, triggers encountered during the day, and strategies that had worked. On a day when the student arrived unsettled after a disrupted morning routine at home, the parents' note alerted the teacher in advance, who pre-empted the difficulty by shortening the first task and offering a familiar visual schedule, and a potential breakdown did not materialize. By contrast, on an occasion when the notebook was not exchanged for several days, a minor change in seating went uncommunicated and escalated into a refusal to enter the classroom that took most of a morning to resolve. This within-case contrast shows how synchronized observation converted dispersed knowledge into timely, coordinated support, whereas its lapse left each party acting on partial information.

The findings therefore suggest that relational synchronization provides a regulatory means within inclusive settings. Synchronized relationships have a coordinating effect in different support contexts such that students are in a kind of predictable communicative setting that supports the stability of their participation.

5.3. Structural Continuity: Institutional Mechanisms of Inclusion Stability

At the structural level, the review makes clear that institutional coordination systems played a key role in the stabilization of long-term inclusion. These structures provided the institutional organizational system to sustain collaboration over the long term between multiple stakeholders over longer time periods.

A key mechanism was structural continuity, that is the stability provided by institutional systems to maintain support strategies over changes in context. This continuity was provided by standardized forms, multidisciplinary coordination meetings, and clearly defined roles for support staff.

Individualised support plans were the core coordination tools for these institutional systems. A synthesis of the input from teachers, therapists and administrators placed these plans as a shared basis for decision making and maintained intervention coherence across teaching contexts. Having these formalised structures was less dependent on informal communication and avoided issues of fragmented support.

The findings also indicate that continuity of structure was particularly important during transitions, such as a change in classroom teacher, or changes in academic expectations. Without institutionalized coordination structures, transitions often produced substantial disruption to participation. Conversely, where structures were strong, inclusion remained stable in the face of personnel or contextual changes.

These observations highlight that the sustainability of inclusion depends not only on interpersonal relation-

ships but also on institutional structures that stabilize support processes over time.

5.4. Ecological Extension: Community Contexts as Inclusion Amplifiers

Beyond the school environments, this study's findings suggest that community participation served as an important extension of inclusive ecosystems. Structured community participation enabled students to generalize their communication skills and practice flexible behaviour in a wider range of community settings.

Nevertheless, community inclusion did not happen spontaneously. Positive participation required careful ecological preparation of the environment, such as pre-structured participation activities, visual supports and planned engagement of support staff, which minimized environmental unpredictability and allowed the students to better navigate their social world.

Community context contributed also to the broader social impact of inclusion. Participation in community public activities promoted peer understanding and facilitated gradual normalization of diversity in the local community. Such social appreciation reduced the impact of stigmatization and helped create more supportive contexts for inclusive future efforts.

These findings therefore suggest that inclusion sustainability requires ecological continuity across multiple contexts. Classroom-based participation gains need to be bolstered by opportunities for participation across broader social environments.

5.5. Cross-Level Integration: Inclusion as Ecological Regulation

Synthesizing findings across levels of analysis points to inclusive education as a system of ecological regulation rather than a compilation of stand-alone interventions. Interactional stabilization, relational synchronization, structural continuity, and ecological extension are complementary components that collectively sustain participation.

A focused cross-case comparison clarifies what the two cases share and where they diverge. In terms of similarities, both cases depended on the same four mechanisms—interactional stabilization, relational synchronization, structural continuity, and ecological extension—and in both, participation eroded whenever any one mechanism lapsed. The principal difference lay in scope and locus: in Case 1 these mechanisms operated chiefly within the dyadic family–school relationship and a single classroom, whereas in Case 2 they were distributed across a wider network of community organizations and professional services. An emerging pattern cut across this difference: the same regulatory function recurred at progressively wider ecological scales, such that what a single teacher achieved in Case 1 through pacing and a shared notebook was achieved in Case 2 through multi-agency coordination and pre-structured community activities. **Table 1** summarizes this comparison and maps each mechanism to the corresponding level of the analytical framework.

Table 1. Cross-Case Comparison of the Four Inclusion Mechanisms.

Mechanism (Framework Level)	Case 1: Family–School Collaboration	Case 2: Community-Networked Support	Cross-Case Pattern
Interactional stabilization (micro)	Teacher paced instruction and used visual step-cards to keep one student engaged in class.	Coordinators pre-structured tasks and visual supports across varied community settings.	Participation depends on stabilizing the communicative environment, not on remediating the individual.
Relational synchronization (meso)	Daily home–school notebook aligned parent and teacher interpretations; lapses caused breakdowns.	Multi-agency information sharing aligned family, school, and service providers.	Trust-based, continuous exchange converts dispersed knowledge into timely support.
Structural continuity (macro)	Individualised support plan and periodic teacher–parent reviews maintained coherence.	Multidisciplinary meetings and defined staff roles sustained support across institutions.	Formalised routines buffer inclusion against personnel and contextual change.
Ecological extension (community)	Classroom gains reinforced through prepared participation beyond the single room.	Structured community participation generalised skills and reduced stigma.	Classroom gains endure only when extended through prepared cross-context opportunities.

Interaction of these mechanisms is dynamic. Weakness in one area opens opportunities for compensatory effects in others, but enduring erosion tends to undermine the overall inclusion system. Sustainable inclusion therefore depends on maintaining alignment across all ecological levels.

This integrated perspective implies that inclusion is fundamentally a systemic achievement. It emerges from the coordinated dynamic system of interactional, relational, institutional and ecological mechanisms that collec-

tively regulate inclusion opportunities for autistic students.

6. Discussion

6.1. Interactional Stabilization and the Regulation of Multimodal Participation

The findings of this study at the interactional level extend a growing stream of research conceptualizing classroom participation as a dynamically managed communicative practice rather than a static individual ability. Previous work on multimodal interaction within classrooms suggests participation is achieved in the co-ordination of verbal, visual and embodied communicative resources rather than relying on linguistic competence [25,27].

The present study extends this way of thinking about participation by showing how multimodal scaffolding specifically plays out as a facilitation of interactional stability for autistic students. Unlike neurotypical learners, whose participation is typically based on quickly negotiating verbal processing, autistic students' participation often suffers from temporal mismatches between communicative input and their capacity to process it. Such mismatches produce interactional breakdowns when classroom communication proceeds faster than the rate at which students can process it.

Multimodal supports, such as visual schedules and structured gesture cues, operate as regulatory devices that lower temporal uncertainty in the interactional environment. These supports act as predictable "communicative markers," which means that students can anticipate what an interaction will require and align their responses accordingly. This finding mirrors the ecological views of communication, according to which participation matters on grounds of the stability of environmental affordances, rather than on the grounds of individual capacities [20].

It is important to note that the study indicates interactional instability, rather than communicative impairment, is often the root cause of exclusion. This finding runs counter to deficit accounts of autism that locate the problem primarily within the individual. It indicates that inclusive participation can be significantly enhanced by reshaping the temporal and multimodal structure of the classroom's communication.

6.2. Relational Synchronization and Trust-Based Coordination

Relational findings point to the salience of trust and shared interpretations in maintaining inclusion. Prior research on family-school collaboration emphasizes the importance of frequency of communication and information sharing [21]. However, the present study demonstrates that effective collaboration extends beyond informational interaction to involve deeper processes of relational synchronization.

Relational synchronization refers to the operational congruence of stakeholders' interpretations of students' behaviors, needs, and support strategies. It is also dynamic, calling for continuous synchronizing. Trust is central to this process, reducing defensive communication and enabling open communication about uncertainties.

When trust is established, families and teachers can bring the behaviour change together in their interpretations as appropriate responses to contexts rather than fixed traits. This openness to interpretation allows stakeholders to make supportive adaptations proactively and to respond to low-grade difficulties in behaviours without them spilling over into long-term participation limitations.

Conversely, without relational trust, communication is transactional and problem-centred, reducing the opportunity for problem-solving and jointly tackling challenges. Patterns like these accord with ecological models of inclusive education viewing relational networks as the primary buffers between private individual needs and institutions' response to them [20].

6.3. Structural Continuity and Institutional Stabilization Mechanisms

These structural findings underpin the logic of institutional coordination systems in promoting inclusive practices over time. Previous studies have shed light on the role of institutional support in promoting inclusive education [11], but focused less on the contributions of institutional structures toward stability of support participation.

The present study identifies structural continuity as a focal mechanism of institutional stability. Formal documentation systems, coordination meetings among multiple stakeholders, and consistent distribution of personnel roles provide organizational predictability that dampens variability in support provided. These systems act as institutional buffers that shield inclusive practices from being disrupted by personnel changes or transitions in the context.

This finding agrees with insights of systems theory, according to which complex organizational processes demand stable institutional coordination infrastructures for institutional functioning [20]. By institutionalizing support routines, schools can transform inclusion from an individual initiative into a sustainable systemic practice.

6.4. Ecological Extension and Community Participation Dynamics

Ecological findings indicate that inclusive education cannot be defined as classroom centred. Community involvement contributes to extend and deepen communication skills in a wider array of social contexts. This observation echoes ecological models of human development, which explain participation outcomes as the result of interactions across contexts and environments [20]. International evidence likewise indicates that community and school attitudes materially shape autistic students' experiences, underscoring the value of building wider social acceptance alongside individual support [28].

However, the study reveals that community inclusion is not the spontaneous result of exposure to social environment. Effective participation requires ecological preparation, including regular routines of interaction and predictable support from different agents. Without ecological preparation, a more complex community environment overwhelms the adaptive capacity of students.

These findings indicate that inclusive education should be conceived as a continuous cross-contextual process and include ecological continuity. Skills acquired in the classroom must be extended through prepared opportunities for participation in larger social spaces.

6.5. Inclusion as an Ecological Regulation System

Adding up findings across levels, this study proposes that inclusive education functions as an ecological regulation system (**Figure 2**). Participation is maintained through interactional stabilization, relational synchronization, structural continuity and ecological extension in their coordinated operation.



Figure 2. The Ecosystem of Inclusion (author-constructed conceptual model).

This conceptualization extends the existing inclusion theories by linking micro-level interactional processes to macro-level institutional dynamics. Instead of treating them as distinct levels, the ecological regulation model regards their dependence on each other and dynamic alignment.

Such a view offers a richer explanation of the differences found in the outcomes of inclusive education. It shows that for inclusion to succeed, it is not only due to the effect of specific actions, but depends on the ability of inclusive education ecosystems to regulate complexity at different levels.

The novelty of this account lies in specifying how the levels connect. Whereas earlier work has tended to

treat micro-interactional, relational, and institutional explanations of inclusion as separate literatures [19–21], the ecological regulation model identifies a single recurring function—the regulation of communicative and relational uncertainty—that operates at every level and binds them together. It also reframes the relationship between intervention and environment: evidence-based practices and Universal Design for Learning are not, on this account, free-standing techniques but resources whose effects are realized only when the surrounding relational and institutional system is coordinated enough to enact them consistently [9]. This integrative claim distinguishes the present study from both intervention-centred and placement-centred accounts of autism inclusion.

These conclusions carry concrete implications for practice. First, because breakdowns more often reflect environmental instability than individual deficit, teacher preparation should prioritize the design of predictable, multimodal communicative environments—consistent routines, visual scaffolds, and managed pacing—in line with Universal Design for Learning. Second, schools should treat family–school collaboration as an ongoing, trust-based process rather than periodic reporting, for instance through low-effort but continuous exchange such as a shared communication log. Third, durability depends on institutionalizing coordination—individualised plans, multidisciplinary review, and clearly assigned roles—so that support survives changes of teacher or setting. Fourth, sustaining inclusion requires deliberately extending classroom gains into prepared community participation rather than assuming they will generalize on their own. The findings also carry implications for communication and language intervention specifically: gains achieved through clinic- or classroom-based communication interventions are most likely to be maintained and generalized when the surrounding ecology is coordinated to support them, which argues for embedding such interventions within naturalistic routines and for equipping families and teachers as everyday communication partners [10,18]. Taken together, these implications suggest that investment in the relational and ecological infrastructure of inclusion may yield greater returns than the addition of further stand-alone interventions.

7. Conclusions

7.1. Reframing Inclusive Education as a Multimodal and Relational Process

Our study aimed to recast inclusive education for autistic children by linking multimodal communication theory to an ecological perspective on family–school–community co-working. Our findings depart from standard conceptions of inclusion as participation in the form of verbal performance or academic compliance. Rather, they show how inclusion is fundamentally relational and interactional, a matter of dynamic multimodal collaboration.

Across the cases examined, autistic children were seen as actively making sense in coordinated uses of semiotic resources such as gaze direction, gesture patterns, spatial positioning, and embodied interaction with other objects in the social environment. These communicative resources, often unobserved in ordinary classroom evaluations, proved essential to participation and to maintaining common ground. In foregrounding multimodal resources, this study reversed the orientation from deficits in speech to capacity for action and interactional adaptation.

Importantly, inclusion emerged as more than just an institutional process but as an evolving process of co-regulation across participants. Teachers, parents and peers thus emerged as interactional partners constantly scaffolding communicative possibilities. These findings also indicate that inclusive education cannot be accounted for solely in structural indicators, such as classroom placement, but should be observed in micro-interactional dynamics.

7.2. Ecological Co-Construction of Participation across Contexts

One key contribution of this study is showing that inclusive participation is joint constructions across connected ecological systems. Rather than functioning independently of each other, family, school and community environments were a continuous communicative network that shaped children’s trajectory of participation.

Within family contexts, caregivers’ attunement to subtle multimodal signals provided early scaffolding for communication development. This communication attunement allowed children to develop patterns of joint attention and affect regulation. When this interactional development and attunement was successfully extended into the classroom, children were more flexible and were less subject to communicative breakdown.

At the school level, teachers’ responsiveness to multimodal cues had significant effects on participation outcomes. For classrooms to facilitate sustained participation, they needed to offer flexibility around interaction tim-

ing, multimodal alternative responses, and spatial mobility and layout. In contrast, rigid communication norms often led to very little meaningful participation when children were physically integrated.

Community environments further contributed to inclusive experiences by offering avenues for less structured social interactions for children in which they could play roles out of academic expectations. Such environments afforded the opportunity to generalize effectively communicative competences across contexts and to support the ecological consistency needed for this form of inclusive provision to have lasting effects.

Taken together, these findings highlight that effective inclusion is not the product of particular actions but rather requires communicative practices across ecological systems to become coordinated. Inclusive education therefore functions as a distributed relational process rather than a single institutional outcome.

7.3. Methodological and Practical Contributions

Methodologically, this article advances inclusive education research by showing how to integrate multimodal discourse analysis with ecological case study approaches. Conventional assessment is focused on a commonly utilised verbal measure of assessment that does not capture the complexity of real-life interactions. In contrast, using the multimodal analysis approach highlighted in our study makes it possible for researchers to document participation as an ongoing, contextually situated process. It thus provides a stronger grasp of how communicative competence emerges from interactional processes, and also provides a systematic approach for identifying distinct and nuanced patterns of participation that cannot be acknowledged through conventional assessment.

Practically speaking, the results highlight the importance of interactional sensitivity in inclusive practice. Meaningful inclusion involves educators' being aware of the different forms that various communication takes and creating spaces that enable multimodal engagement with diverse populations. This will not just require teachers to adjust their teaching practices, but to also support collaboration among families, schools, and community stakeholders.

Moreover, this study indicates that sustainable inclusion relies on systems for systemic coordination rather than isolated intervention programmes. Practices and policies should therefore place relational continuity, ecological coordination, and multimodal engagement at the heart of inclusive educational systems.

7.4. Limitations and Directions for Future Research

While the study provides an in-depth understanding of the interactional dynamics of inclusion, there are a number of limitations. The case-based design provides rich description, however, it also limits the generalizability of study findings to a wider population. Future research could include longitudinal and cross-site research that would investigate how multimodal participation changes at different developmental stages and transitions.

In addition, while the ecological framework captures relational complexity, future research should provide more investigation into the factors by which institutional policies and cultural expectations impact interactional practices of inclusion. Comparative research across cultures would be useful in identifying key systemic factors that enable or inhibit multimodal participation.

Future research will also benefit from integrating technological tools, such as multimodal annotation software and digital tracking of communication, to improve the accuracy and scale of interactional analysis [29]. This in turn can help build more appropriate and inclusive approaches to assessing the lived experience of interaction for autistic learners.

Author Contributions

Initial drafting of the manuscript, J.S.; data collection, H.Z.; manuscript revision, C.W.; review and final proof-reading of the manuscript, J.S., H.Z., C.W., and N.F. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

Because the material originated as routine educational documentation rather than as a prospective research project, it was not submitted for formal research-ethics-committee review; the work was nonetheless carried out in accordance with the ethical principles of the Declaration of Helsinki, with participant privacy and confidentiality protected throughout.

Informed Consent Statement

Informed written consent was secured from all adult participants and from the legal guardians of all minor participants. The study relied exclusively on anonymized case documentation with all personal identifiers removed. Participants' dignity and privacy were fully respected.

Data Availability Statement

The data consist of anonymized case documentation records, including narrative descriptions, observational accounts, and visual materials. All personal identifiers have been removed to protect participant privacy. The data are not publicly available due to privacy restrictions. Anonymized excerpts are presented within the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

During the preparation of this work, the authors used Claude for proofreading. The authors subsequently reviewed and edited the content as necessary and take full responsibility for the final content of the published article.

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