



**PEDAGOGICAL MECHANISMS FOR OVERCOMING
SECONDARY LIMITATIONS IN PSYCHOSOCIAL
DEVELOPMENT AND EDUCATIONAL PROCESSES OF
CHILDREN WITH DEVELOPMENTAL DISABILITIES**

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ABSTRACT

This IMRAD-formatted study examines psychosocial development in children with disabilities and pedagogical mechanisms to mitigate secondary limitations within schooling. Using a mixed-methods design—normative analysis, quasi-experiment, standardized scales, classroom observations, and focus groups—we implemented an intervention package combining UDL, cooperative learning, peer-mediated support, PBIS elements, social-emotional learning, and assistive technologies. Results showed significant gains in participation, literacy and numeracy performance, sociometric centrality, and self-efficacy, alongside reductions in learned helplessness and social isolation. We discuss alignment with Vygotsky's concept of secondary defects, Bronfenbrenner's ecological model, the ICF framework, UNESCO inclusion guidelines, and UDL theory. Practical recommendations are proposed for school-family-community partnerships.

Introduction

The academic success of children with developmental disabilities is often determined not only by primary functional limitations but also by secondary restrictions arising in the social environment. L.S. Vygotsky describes this phenomenon as: *"The primary defect gives rise to secondary disturbances, mainly of social origin"* (Vygotsky, 1983, p. 92). This perspective emphasizes that the central task of psychological and pedagogical intervention is not merely the "correction" of the biomedical problem, but rather the prevention and mitigation of socio-psychological consequences. Our research is specifically aimed at developing practical mechanisms within this framework.

U. Bronfenbrenner, who explains the ecology of child development, writes: *"Development is the result of reciprocal interactions between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate environment"* (Bronfenbrenner, 1979, p. 21). This view highlights that the school environment can either exacerbate or mitigate secondary limitations through its



interactions with the child. Therefore, interventions must be designed not only at the individual level but also at the classroom and school levels.

The International Classification of Functioning, Disability and Health (ICF), adopted by the World Health Organization, states: *“Disability is an interaction between individuals with a health condition and personal and environmental factors”* (WHO, 2001, p. 8). Our methodological approach also centers on this interaction: the goal is to modify the environment, diversify instructional delivery, and systematically reduce participation barriers.

International standards for inclusive education support this logical consistency: *“Inclusive education is a process of addressing and responding to the diversity of needs of all learners”* (UNESCO, 2009, p. 8). Accordingly, we approached pedagogical mechanisms through the integration of Universal Design for Learning (UDL), collaboration, socio-emotional teaching, systematic behavior support, and assistive technologies.

Methods

Research Design. A multi-method approach was employed: (1) theoretical and normative-analytical comparison; (2) quasi-experimental design in 16 classrooms across 6 general education schools (pre- and post-intervention with control groups); (3) in-depth observation and sociometry; (4) focus groups (parents, teachers, defectologists, psychologists). The sample consisted of 124 students aged 7–10 (45% girls, 55% boys), including those with hearing impairments (n=28), autism spectrum disorders (n=22), speech delays (n=31), motor control difficulties (n=19), and mild intellectual disabilities (n=24). Families with varying socio-economic status were included.

Measurement Tools. Psychosocial indicators were assessed using the Strengths and Difficulties Questionnaire (SDQ); quality of life was measured via the Pediatric Quality of Life Inventory (PedsQL); adaptive functioning via the Vineland Adaptive Behavior Scales; social networks through Moreno sociometry; teacher competence through the Teacher Efficacy for Inclusive Practices scale; and academic performance in reading and mathematics was evaluated with state-standard diagnostic assessments. Classroom participation, multimodal teaching, and UDL implementation were monitored through observation protocols.

Intervention Packages. Over a 16-week cycle, the following components were implemented:

(a) Multimodal presentation, comprehension, and expression based on UDL. As Meyer, Rose, and Gordon note, *“UDL proactively designs for variability rather than retrofitting for disability”* (Meyer, Rose, Gordon, 2014, p. 7). This principle guided the pre-planning of varied lesson designs in our intervention.

(b) Cooperative learning (jigsaw, think-pair-share) and peer mediation: *“Positive interdependence is the heart of cooperative learning”* (Johnson, Johnson, Holubec, 2008, p. 5). We emphasized tasks that foster positive interdependence.

(c) Positive Behavioral Interventions and Supports (PBIS) elements: transparent and flexible classroom rules, positive reinforcement, and visual schedules.

(d) Socio-emotional teaching modules (self-regulation, empathy, flexible interaction).



(e) Assistive technologies: captions, text-to-speech on screens, sensory-friendly corners.

(f) Family collaboration: monthly parent seminars and home activity cards.

Theoretical Basis of Educational Support. Hattie emphasizes: “*The biggest effects on student learning occur when teachers become learners of their own teaching*” (Hattie, 2009, p. 238). In this spirit, cyclic reflective sessions were conducted with teachers, and lesson video analyses were used to adapt UDL and cooperative strategies. Additionally, as Bandura describes, “*Self-efficacy beliefs affect thought patterns that may be self-aiding or self-hindering*” (Bandura, 1997, p. 116). Micro-goals and progress visualization were introduced to strengthen self-efficacy in both students and teachers.

Data Analysis. Quantitative data were analyzed using aggregated mixed models, t-tests, ANOVA, and Cohen’s d; qualitative data underwent thematic content analysis. Significance level $\alpha = 0.05$.

RESULTS

Psychosocial Indicators. In the intervention group, the total SDQ score decreased from 16.3 ± 5.2 to 12.1 ± 4.8 ($t=4.11$; $p<0.001$; $d=0.58$), whereas no statistically significant changes were observed in the control group. PedsQL subscales showed an overall quality of life increase of +8.7 points ($p<0.01$; $d=0.52$). On the Vineland socialization subscale, the intervention group demonstrated an increase of +6.1 points ($p<0.01$).

Social Networks and Participation. Sociometric results indicated that the mean score of students being nominated as a “preferred partner” in the intervention group increased 1.8 times; the classroom “centrality index” rose from 0.31 to 0.47 ($p<0.01$). These findings suggest that, in line with UNESCO’s “diversity of needs” thesis, the intervention strengthened social inclusion within the educational environment.

Academic Outcomes. In comprehensive literacy tests, the intervention group showed a combined +12.4% increase in reading speed and comprehension ($p<0.01$), and a +9.1% improvement in procedural and conceptual mathematics tasks ($p<0.05$). Hattie’s conclusion that the “effects are greater when teachers become learners of their own teaching” (Hattie, 2009) aligned with our observations.

Secondary Constraints. In focus groups, teachers noted a reduction in “learned helplessness” behaviors; as Bandura emphasized, self-regulation strategies gradually replaced “self-hindering” thought patterns (Bandura, 1997). Correspondingly, students’ “fear-avoidance” responses to academic tasks decreased, enhancing risk-taking abilities.

Classroom Environment and Behavior. In classrooms implementing PBIS elements, adherence to rules improved by 18%, and referrals decreased by 27%. This outcome demonstrates the practical effectiveness of institutional principles regulating “reciprocal interactions,” as described by Bronfenbrenner.

Qualitative Data. Parents emphasized increased student engagement through providing multiple ways of learning at home (UDL). Teachers reported that clearly defined roles in cooperative teaching (leader, recorder, checker) transformed peer mediation into a “no-gap” mechanism ensuring positive interdependence (Johnson et al., 2008).

DISCUSSION



The results indicate that secondary constraints are highly sensitive to the pedagogical environment. Vygotsky's notion of "secondary disabilities" elaborates on this process: "secondary disabilities... are formed during the course of the child's social development" (Vygotsky, 1983, p.103). We consider this perspective appropriate, as our interventions reduced "secondary" barriers through order, rules, roles, and visual supports in socially controlled environments.

From Bronfenbrenner's model, optimizations in the microsystem (classroom, peers) and mesosystem (school-family connections) produce immediate effects on psychosocial indicators rather than solely cognitive outcomes. This aligns with his statement: "development is the result of reciprocal interactions..." (Bronfenbrenner, 1979). Accordingly, our intervention was implemented not just as individual tutoring but through classroom-level planning.

According to the ICF framework, disability arises from the interaction between the individual and environment: "Disability is an interaction..." (WHO, 2001). Therefore, the preemptive integration of UDL and assistive technologies addressed the need to create an environment suitable for all from day one, rather than adapting resources later. As Meyer, Rose, and Gordon note: "UDL proactively designs for variability..." (2014). We argue that this philosophy ensures the prevention of secondary constraints.

UNESCO emphasizes the processual nature of inclusion: "Inclusive education is a process..." (UNESCO, 2009). Our results showed that this "process" is effective when implemented across three levels—pedagogical design, classroom behavior systems, and parent partnership. Additionally, PBIS elements supported discipline not through punishment, but via positive reinforcement and visual-cognitive structures clarifying ultimate goals.

In cooperative teaching, the "positive interdependence..." highlighted by Johnson et al. (2008) fulfilled a key didactic function. In our experience, clearly defined roles reduced social isolation, allowing students to experience the power of "collective contribution." This aligns closely with Bandura's theory that "self-efficacy beliefs affect thought patterns..." (1997); positive peer feedback and visualized small achievements strengthened students' cognitive schema of "I can do this."

According to Hattie's principle that "teachers become learners of their own teaching" (2009), video analysis and reflection cycles produced significant changes: individualized visual cues, checklists, and micro-routines reduced classroom uncertainty and increased participation. Consequently, one of the secondary constraints—tendency to withdraw—was mitigated.

Finally, Shonkoff and Phillips emphasize the importance of early childhood environments and relationships as follows: "Early environments matter and nurturing relationships are essential" (Shonkoff & Phillips, 2000, p. 5). In our view, this notion can also be extrapolated to school-age children: "nurturing relationships" and predictable expectations help limit the development of secondary disabilities.

LIMITATIONS AND ETHICAL CONSIDERATIONS

The study has a quasi-experimental design; the groups were not fully randomized. The distribution of types and severity levels of impairments in the sample was uneven.



There are limitations regarding the cultural adaptation of measurement tools. Long-term follow-up data are limited. From an ethical standpoint, participant consent, confidentiality, and safety protocols in the use of assistive technologies were ensured.

PRACTICAL RECOMMENDATIONS

- Systematically integrate UDL into the school curriculum: present lesson objectives through multiple channels, offer alternative tasks, and utilize multiple modes of expression.
- Strengthen cooperative learning based on the principle of “positive interdependence” through clearly defined roles, assessment criteria, and group reflection.
- Implement classroom-level foundations of PBIS: visualize 3–5 rules, establish a clear reward system, and provide data-informed feedback.
- Deepen the Individualized Education Program (IEP): set SMART goals (Specific, Measurable, Achievable, Relevant, Timely) and foster parent collaboration.
- Strengthen the school–family mesosystem through parent workshops and home activity charts.
- Provide ongoing coaching for teachers on the safe and purposeful use of assistive technologies.
- Cycle teacher reflection sessions: analyze lesson videos, observe peers, and make data-driven decisions.

CONCLUSION

The study demonstrated that secondary disabilities in children with developmental impairments are strongly influenced by the design of the pedagogical environment and relationships. The integration of UDL, cooperative learning, PBIS, social-emotional learning, and assistive technologies consistently increased engagement, improved psychosocial outcomes, and reduced the intensity of secondary disabilities. Theoretical alignment was observed with the perspectives of Vygotsky, Bronfenbrenner, the ICF, and UNESCO. In practice, the triad of school–family–community and reflective teacher practices emerged as decisive factors. Future research should focus on long-term follow-up, differentiated models for various impairment types, and inclusion in digital environments (remote and hybrid formats).

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