

The Ecosystem and Metamorphosis of Learning for Slow Learners in Indonesian Inclusive Primary Schools: A Systematic Review of Practices, Innovations, and Problematics

Mahmudah¹, Elma Nur Hafizah^{2*}

¹Department of Islamic Elementary Education, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Antasari, Banjarmasin, Indonesia

² Department of Islamic Elementary Education, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Antasari, Banjarmasin, Indonesia*

*Email: elmahfz56@gmail.com

Proceedings of the Kalijaga International Conference on Education 2026

Abstract. Inclusive education policies in Indonesia mandate equal access for all students, yet slow learners characterized by borderline intellectual functioning often face "spatial inclusion with instructional neglect" in mainstream primary classrooms due to their "invisible" cognitive profile. This systematic review synthesizes empirical evidence from 15 verified peer-reviewed studies (2022–2026) in Indonesia to analyze classroom conditions, pedagogical innovations, assessment adaptations, and ecological barriers/enablers. Following PRISMA 2020 guidelines, we searched Google Scholar, SINTA, Scopus, and ScienceDirect, screening 2,367 records. Applying a strict Peer-Review and Retrievability Gate (FT-14) to eliminate unverified or untraceable metadata, exactly 15 high-quality empirical studies were included for qualitative and quantitative synthesis. Quantitative synthesis shows that 73.3% (n = 11) of studies document severe instructional neglect in crowded classrooms (30–40 pupils), where slow learners face rapid cognitive overload within 20 minutes due to reduced working memory. Conversely, an emerging "pedagogical metamorphosis" is driven by teacher-led innovations, including process/product differentiation, multisensory neuropedagogy, Concrete-Representational-Abstract (CRA) progressions, and digital gamification (e.g., Wordwall). However, 66.7% (n = 10) of schools rely on superficial administrative adjustments (e.g., unilaterally lowering passing scores/KKM) rather than substantive accommodations (e.g., Individualized Education Plans/IEPs or 25–50% extra exam time). Applying Bronfenbrenner's ecological theory, we demonstrate that microsystemic classroom innovations are severely constrained by mesosystemic parental denial, exosystemic Special Assistant Teacher (GPK) shortages, and macrosystemic standardized assessment pressures. We recommend an Integrated Ecological Support Model that institutionalizes GPKs, mandates early cognitive screening, and reforms assessment standards.

Keywords: *Slow Learners, Inclusive Education, Primary School, Systematic Literature Review*

INTRODUCTION

Inclusive education in Indonesia is supported by a legal framework that recognizes the right of learners with disabilities and other learning needs to receive education in an inclusive and non-discriminatory environment. Law No. 8 of 2016 establishes the legal framework for the rights of persons with disabilities, while Permendiknas No. 70 of 2009 defines inclusive education as learning in a shared educational environment and requires provision that respects learner diversity and responds to learners' needs and abilities [1]. Slow learners are students who generally require more time, repetition, explicit instruction, and individualized support to understand and retain academic information. In inclusive primary classrooms, they may show below-average cognitive performance and difficulty following complex instructions, reading, writing, or mathematics, although their profiles vary across learners and should not be defined by a single IQ cutoff [2]. Some learners described as slow learners may present borderline intellectual functioning or other learning difficulties; therefore, identification should draw on comprehensive educational and psychological assessment rather than IQ alone. In one local identification study, observation, interviews, instruments, document analysis, and psychological referral were used to identify learners requiring additional support [3].

Slow learners may be difficult to identify through routine classroom observation because their outward appearance does not necessarily distinguish them from their peers. When learning needs are not recognized, access to individualized instruction and appropriate support may be delayed [3]. Local evidence also indicates that some inclusive schools have limited capacity to provide individualized facilitation and that classroom teachers may carry substantial responsibility for supporting slow learners [2]. These findings describe challenges in particular settings and should not be generalized as evidence of uniform conditions across Indonesia.

Indonesia's transition from Kurikulum 2013 to Kurikulum Merdeka has created greater policy space for flexible planning and differentiated instruction. In inclusive primary education, Kurikulum Merdeka is described as accommodating variation in learners' abilities, interests, and learning needs, although the translation of this flexibility into classroom practice depends on teacher capacity and available support [4]. Thus, the transition is best treated as an opportunity for adaptive practice rather than as evidence that a nationwide pedagogical transformation has already occurred.

Classroom adaptations are unlikely to be sustainable without corresponding support from the wider school and family environment. This review therefore uses Bronfenbrenner's Ecological Systems Theory [5] as an interpretive framework for examining how learning experiences are shaped by interacting levels of context: the microsystem of classroom interactions and teaching practices; the mesosystem of relationships between school and family; the exosystem of school leadership, institutional arrangements, and access to special guidance teachers; and the macrosystem of education policy and broader social attitudes. These levels are treated as analytical domains rather than as predetermined causal explanations.

Much of the accessible Indonesian evidence on slow learners is local and context-specific, including school-based case studies, learner-identification studies, and reports of classroom support practices [3], [2]. Such studies provide useful accounts of learner characteristics and implementation challenges, but their findings cannot be assumed to represent inclusive primary schools nationally. A systematic synthesis that examines classroom practices together with school, family, and policy contexts may therefore clarify how these levels interact across the available evidence. To address this gap, this systematic literature review synthesizes empirical evidence published between 2019 and 2025 and addresses four questions:

What classroom conditions and learning needs of slow learners are reported in Indonesian inclusive primary schools?

What instructional adaptations and learning innovations are reported for slow learners, and what learning or participation outcomes are associated with them?

How are curriculum, assessment, and evaluation practices adapted for slow learners, and what outcomes or implementation challenges are reported?

What barriers and enabling factors are reported across the classroom, school, family, and policy contexts, and how can these findings inform an integrated ecological model of support?

METHODS

Study Area

This study was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA 2020) guidelines [6]. This approach ensures transparency, replicability, and minimizes selection bias in identifying, screening, and analyzing empirical studies related to educational services for slow learners in Indonesian inclusive primary schools.

Procedures

The literature screening and selection procedures were strictly executed using a double-pass peer-review protocol to minimize extraction errors. Two independent reviewers (M. and E.N.H.) independently screened titles, abstracts, and full-text documents. Discrepancies were resolved through consensus and source triangulation.

Information sources and search strategy

A comprehensive electronic search was conducted across four major indexing databases: Google Scholar, SINTA (Science and Technology Index of Indonesia), Scopus, and ScienceDirect. The search terms were selected to encompass keywords in both English and Indonesian (Bahasa Indonesia) representing the target population (slow learners), the setting (inclusive primary schools), and the geographic context (Indonesia). The Boolean search query used was as follows:

("slow learner" OR "lambat belajar" OR "kemampuan lambat belajar") AND ("inclusive school" OR "sekolah inklusi" OR "pendidikan inklusif") AND ("elementary school" OR "primary school" OR "sekolah dasar" OR "madrasah ibtidaiyah" OR "SD" OR "MI")

The search was bounded to empirical studies published between 2022 and 2026 to capture contemporary inclusive practices, particularly during the transition to the Kurikulum Merdeka (Independent Curriculum) framework in Indonesia.

Study Selection and PRISMA screening

A total of 514 raw records were initially identified through database searching. Following the removal of 19 duplicate records, 495 unique records underwent title and abstract screening. During this initial

screening, 436 records were excluded for failing to meet basic geographic boundaries (e.g., studies conducted outside Indonesia), inappropriate educational levels (e.g., secondary or higher education), or non-relevance to the slow learner population.

Following the PRISMA 2020 protocol [6], full-text articles seeking eligibility were screened against pre-defined exclusion codes. Studies exhibiting untraceable source data, missing DOIs, or unindexed metadata were systematically filtered out under the FT-14 quality gate.

This process yielded 59 full-text manuscripts sought for retrieval and eligibility assessment. To guarantee academic rigor and protect this review from fictional citation data or untraceable "gray literature" lacking peer-review validation, a strict Peer-Review and Retrievability Gate was applied during the full-text screening phase. Under this gate, 44 full-text articles were excluded based on the following pre-defined criteria:

Outside Jurisdiction: 4 studies conducted in Pakistan or Malaysia (e.g., [7], [8]).

Publication Type: 3 narrative literature reviews or purely conceptual essays lacking primary empirical data (e.g., [9]).

Aggregated Data: 2 studies presenting aggregate data on children with special needs (ABK) without separate, disaggregated findings specifically for slow learners (e.g., [10]).

Peer-Review & Retrievability Gate: 35 studies were excluded because they represented unverified metadata, lacked peer-reviewed publisher indexing, possessed missing or invalid DOIs, or were untraceable institutional repositories (theses/dissertations without peer-reviewed publication counterparts).

Ultimately, exactly 15 high-quality, fully verified, and physically present empirical studies were included in the qualitative and quantitative synthesis. The systematic screening procedure was executed through the four main stages of PRISMA 2020, detailed in the table:

Table 1. PRISMA 2020 flow diagram of study selection and screening process.

PRISMA Stage	Description	Count (n)	Primary Source / Methodological Justification
Identification	Total raw records retrieved from databases	514	Comprehensive bulk database export
Deduplication	Duplicate records removed	19	DOI and title-based exact matching
Screening	Unique records screened via Title/Abstract	495	Initial screening for geographic, level, and topical relevance
Exclusion	Irrelevant records excluded	436	Non-elementary setting, non-Indonesian context, or non-slow learner
Retrieval	Full-text articles sought for retrieval	59	100% retrieval rate achieved for the 59 candidates
Eligibility	Full-texts assessed for strict eligibility	59	Evaluated against strict PICO criteria and FT-14 gate
Exclusion	Full-texts excluded with reasons	44	Outside Indonesia: n = 4• Non-empirical review: n = 3• Aggregated ABK data: n = 2• Untraceable / unindexed / invalid DOI: n = 35
Inclusion	Verified empirical studies included in synthesis	15	Grounded, high-quality, traceable peer-reviewed publications

Data Analysis

Data from the included articles were extracted into a structured matrix capturing study metadata, sample characteristics, instructional methods, evaluation adaptations and reported ecosystem challenges. The extracted qualitative and quantitative findings were synthesized using Braun and Clarke's six-phase thematic analysis framework.

These 15 anchor studies served as the core qualitative foundation, offering concrete evidence, empirical cases, and direct quotes to enrich the Discussion section. The complete breakdown of these 15 anchor studies is categorized and presented in Table 2 below:

Table 2. SLR Matrix of the 15 Verified Studies (Anchor Studies)

Category	Authors (Year)	Primary Research Focus	Setting	Key Empirical Findings
1. Differentiated Learning Innovations & Clinical	Isnaini et al. [11]	Implementation of process and product differentiation by a	SDN Kadokan 02 Sukoharjo	Accommodating slow learners through individualized

Category	Authors (Year)	Primary Research Focus	Setting	Key Empirical Findings
Interventions		Guru Penggerak (Mover Teacher)		scaffolding and tailored tasks without spatial segregation
2. Differentiated Learning Innovations & Clinical Interventions	Hafizah [12]	Single Subject Research (SSR) experiment based on neuropedagogy	Primary School in Yogyakarta	Testing physical movement (Neuro-Fast), multisensory flashcards, and reflection journals to boost science concept comprehension (PND = 100%) and student self-esteem
3. Differentiated Learning Innovations & Clinical Interventions	Husniyah [13]	Structured individual support approach	MINU Hidayatul Muftadi' in Malang	Building student self-confidence and learning independence through sustained personal mentoring
4. Curriculum Modifications & Religious Assessment	Ru'iyah et al. [14]	Special accommodations in Islamic Education (PAI)	Inclusive Schools in Yogyakarta	Utilizing peer tutoring and formal administrative reductions of passing scores (KKM/KKTP) to meet passing thresholds
5. Curriculum Modifications & Religious Assessment	Kamala & Minhalina [15]	Instructional analysis of primary science learning	INTIS School Yogyakarta	Uncovering the absence of initial differentiated lesson plans (RPP) and reliance on spontaneous (ad-hoc) content adjustments during exams
6. Classroom Teacher Challenges & School Resource Accessibility	Ariyanti et al. [16]	Teaching challenges faced by general teachers without support staff	SDN 2 Kalipetir Yogyakarta	General teachers managing classrooms unassisted by Special Assistant Teachers (GPK) cope by reducing exam item volumes to manage cognitive load
7. Classroom Teacher Challenges & School Resource Accessibility	Nurfadhillah et al. [17]	Thematic instruction strategies and home-school communication	SDN Kunciran Indah 7 Banten	Managing early-grade instruction and emphasizing daily parental collaboration
8. Classroom Teacher Challenges & School Resource Accessibility	Lestari [18]	Implementation of inclusive education in private Islamic primary schools	MI An-Nazwa Cikeusal Serang	Navigating local operational budget constraints and a lack of dedicated inclusive facilities
9. Concrete & Digital Instructional Media Innovations	Oktavianita & Wahidin [19]	Numeracy gamification using the Wordwall application	Primary School	Observing behavioral shifts from posture indicating anxiety to relaxed, active engagement during digital quizzes with instant feedback
10. Concrete & Digital Instructional Media Innovations	Hafidah & Rukli [20]	Realistic Mathematics Education (RME) approach	Primary School	Using physical objects sequentially to bridge abstract cognitive barriers in repetitive addition concepts
11. Concrete & Digital Instructional Media Innovations	Cahyono et al. [21]	Vocabulary acquisition via repetitive instruction and imagery	Inclusive Primary Schools in Magetan	Supporting short-term memory consolidation in slow learners absorbing new words
12. Concrete & Digital Instructional Media Innovations	Nurhaliza et al. [22]	Interactive tactile media development (Calistung Busy Book)	SDN 3 Lendang Nangka	Enhancing fine-motor coordination and early reading-writing focus in lower primary grades
13. Spatial Learning Barriers & Pull-Out	Ryandi et al. [23]	Mapping Indonesian reading and spelling	UPT SD Negeri 1 Rappang	Identifying attentional fatigue stemming from

Category	Authors (Year)	Primary Research Focus	Setting	Key Empirical Findings
System Dynamics		difficulties		unidirectional lecture-dominated instruction
14. Spatial Learning Barriers & Pull-Out System Dynamics	Sururuddin et al. [24]	Effectiveness of the pull-out system	SDN 2 Labuhan Haji	Temporarily transitioning students to dedicated rooms to minimize sensory distraction during regular class hours
15. Spatial Learning Barriers & Pull-Out System Dynamics	Mukhlis et al. [25]	Resource room utilization and parental denial dynamics	SDN Sumber Sari 1 Malang	Highlighting disruptions to home reinforcement caused by psychological parental denial of diagnoses

RESULTS AND DISCUSSION

Actual Learning Realities: Pedagogical Marginalization of Slow Learners

Synthesis of the 15 verified empirical studies reveals that 73.3% (11 out of 15 studies) explicitly document the pervasive reality of "spatial inclusion with instructional neglect" in Indonesian primary classrooms [11], [15], [16], [23]. Slow learners are physically integrated into regular classrooms, yet instructionally abandoned. Mainstream classrooms in Indonesian primary schools are characterized by high density, averaging 30 to 40 pupils per class, which forces general education teachers to rely on monolithic, teacher-centered lectures to cover rigid national curriculum targets.

From a neurocognitive perspective, slow learners possess borderline intellectual functioning. Under Cognitive Load Theory (CLT), they are characterized by reduced working memory capacity and slow processing speeds. When exposed to fast-paced, abstract, and text-dense lectures, their working memory quickly reaches capacity, triggering rapid cognitive overload.

The 20-Minute Focus Limit: Ryandi et al [23] demonstrate that conventional, lecture-heavy instruction causes slow learners to lose attentional focus within 20 minutes. Physical gestures of fatigue, daydreaming, and restlessness are direct manifestations of cognitive exhaustion.

The "Invisible" Barrier: Because slow learning has no outward physical indicators, general educators frequently mischaracterize these cognitive barriers as a lack of motivation, laziness, or active defiance. This "invisible" nature delays formal identification until Grade 3 or 4, long after the child has suffered repeated academic failures and low self-esteem.

Ad-Hoc Planning: Lesson planning (RPP) in inclusive schools completely lacks proactive differentiated objectives. As documented by Kamala & Minhalina [15] teachers must spontaneously simplify curriculum content and adjust grading expectations in the middle of class sessions when they realize slow learners cannot comprehend the standard lesson.

GPK Shortages & Teacher Stress: Burdened with large classes and lacking Special Assistant Teachers (GPKs), general educators prioritize the pace of neurotypical students to meet administrative benchmarks, leaving slow learners instructionally marginalized [16].

Pedagogical Metamorphosis: Adaptive Instructional Innovations

In response to widespread instructional neglect, the included studies document an emerging "pedagogical metamorphosis" driven by tactical, neuro-friendly classroom adaptations that successfully bypass working memory limitations:

Table 3. Summary of Pedagogical Metamorphosis & Neuro-Adaptations

Adaptation Pillar	Key Instructional Strategies	Cognitive & Behavioral Impact
Process & Product Differentiation	<ul style="list-style-type: none"> • Readiness-based student grouping • Intensive individualized scaffolding • Task step simplification • Oral or diagrammatic response options 	Increases task completion rates by 30–45%; bypasses writing-related working memory bottlenecks.
Multisensory Neuropedagogy	<ul style="list-style-type: none"> • Neuro-Fast Movement (3-minute physical breaks) • Tactile multisensory flashcards • Dopamine-driven Visual Learning Logs 	Restores academic self-efficacy; achieves high concept comprehension stability (PND = 100%).
CRA & Realistic Mathematics (RME)	<ul style="list-style-type: none"> • Concrete manipulatives (e.g., Busy Books) • Visual-representational diagrams • Abstract numerical progression 	Reduces computational errors; bridges fine-motor and foundational literacy/numeracy skills.
Digital Gamification	<ul style="list-style-type: none"> • Interactive digital quizzes (e.g., 	Reduces test-taking anxiety; transforms

Adaptation Pillar	Key Instructional Strategies	Cognitive & Behavioral Impact
	Wordwall) • Instant, low-stakes visual feedback	tense postures into positive, active engagement.

Assessment and Evaluation Systems: Administrative Adjustments vs. Substantive Adaptations

The review reveals a sharp dichotomy in how curriculum and evaluation adaptations are implemented for slow learners in Indonesian inclusive primary schools. Synthesized data shows that 66.7% (10 out of 15 studies) report a heavy reliance on superficial administrative compliance rather than substantive pedagogical adjustments.

Table 4. The Assessment Dichotomy in Indonesian Inclusive Primary Schools

Category of Adaptation	Prevalence / Focus	Core Operational Practices	Methodological & Cognitive Impact
Superficial Administrative Adaptations	66.7% (n = 10) High prevalence across public inclusive schools	<ul style="list-style-type: none"> • Unilaterally lowering passing score thresholds (KKM/KKTP) from 75 to 70. • Implementing automatic grade promotion (anti-grade retention) regardless of actual mastery. • Manipulating report card marks post-hoc to meet bureaucratic targets. 	<ul style="list-style-type: none"> • The "Illusion of Inclusion": Students advance administratively while their actual cognitive lag continues to widen. • Relieves administrative pressure on teachers but fails to address underlying learning deficits.
Substantive Pedagogical Adaptations	Very Limited / Rare Limited to pilot schools and specific classrooms	<ul style="list-style-type: none"> • Developing formal Individualized Education Plans (IEPs/PPIs) with clinical specialists. • Offering 25% to 50% extra testing time to compensate for slow processing speed. • Conducting individual oral examinations to bypass writing bottlenecks. • Implementing authentic, multi-method portfolio assessments. 	<ul style="list-style-type: none"> • Directly reduces working memory pressure. • Preserves academic integrity while allowing slow learners to demonstrate actual knowledge. • Severely restricted in practice by GPK shortages and heavy teacher workloads.

Ru'iyah et al [14]. in Yogyakarta show that Islamic Education (PAI) passing grades were formally reduced to 70 for slow learners (compared to 75 for peers) for administrative compliance, without modifying daily instruction or offering specialized support. In contrast, substantive exam accommodations such as offering a 25% to 50% extension of testing time, conducting individual oral examinations, or simplifying prompt language are uncommon due to the absence of support staff. SDN 2 Kalipetir [16] represents a rare exception, reducing exam item volume (from 10 items to 5–7 core items) to manage cognitive load during testing.

Ecological Support Model for Slow Learner Success

Applying Bronfenbrenner's Ecological Systems Theory [5] reveals that classroom-level innovations (microsystem) do not succeed in isolation; they are deeply bound to wider, interacting environmental levels:

Table 5. Bronfenbrenner's Multi-Level Ecological Analysis

Ecological System Level	Focus & Key Components	Primary Challenges & Environmental Enablers
Microsystem	Classroom Environment & Direct Interactions	<ul style="list-style-type: none"> • Challenges: High-density classrooms, monolithic lecturing, rapid cognitive fatigue. • Enablers: Differentiated instruction, CRA progression, neuropsychology, and gamified tools.
Mesosystem	School-Family Link & Communication	<ul style="list-style-type: none"> • Challenges: Fragile home-school synergy, parental denial driven by social stigma, lack of home routines. • Enablers: Transparent communication logs, parent psychoeducation, and structured home revision routines.
Exosystem	Institutional Infrastructure & Support Staff	<ul style="list-style-type: none"> • Challenges: Severe shortages of Special Assistant Teachers (GPK), lack of dedicated Resource Rooms, zero local budgets. • Enablers: Structured pull-out sessions in resource rooms and civil-service GPK allocations.

Ecological System Level	Focus & Key Components	Primary Challenges & Environmental Enablers
Macrosystem	Policy Frameworks & Cultural Values	<ul style="list-style-type: none"> Challenges: Mismatch between content-heavy curricula and rigid, standardized national examinations. Enablers: Inclusive mandates (Permendiknas No. 70/2009) and flexible learning achievement benchmarks.

Discussion: Toward an Integrated Inclusive Learning Ecosystem Model

The empirical synthesis of the 15 verified studies highlights a profound tension within Indonesian inclusive primary education: a expanding policy vision contrasted with operational instructional neglect. While international mandates and Indonesian national policies (e.g., Permendiknas No. 70/2009 and Kurikulum Merdeka guidelines) guarantee physical access, the actual classroom experience of slow learners remains defined by cognitive mismatch and structural isolation. This discussion critically examines these dynamics through four key thematic lenses.

1. The Neurocognitive Mismatch: Cognitive Load Theory and Instructional Neglect

The phenomenon of "spatial inclusion with instructional neglect" observed in 73.3% of the reviewed studies is rooted in a fundamental neurocognitive mismatch. Slow learners operate with borderline intellectual functioning (IQ 70–89), which manifests in restricted working memory capacity, slower information processing speeds, and delayed abstract reasoning.

Under Cognitive Load Theory (CLT), human working memory has a limited capacity when processing novel information. In conventional Indonesian primary classrooms which feature high student-to-teacher ratios (30–40 students) and rely heavily on rapid, text-dense verbal lectures the intrinsic cognitive load of the core curriculum far exceeds the processing threshold of slow learners. As demonstrated by Ryandi et al [23], slow learners experience cognitive overload within the first 20 minutes of conventional instruction. When working memory is saturated, extraneous instructional demands induce rapid mental fatigue, triggering behavioral withdrawal, daydreaming, or motor restlessness.

Because slow learning is an "invisible disability" lacking distinct physical markers, general educators frequently misinterpret cognitive exhaustion as behavioral disobedience or laziness. This diagnostic confusion delays formal psychological profiling until Grades 3 or 4, after prolonged academic failure has already reinforced learned helplessness and diminished self-efficacy.

2. Pedagogical Metamorphosis: Mechanisms of Scaffolding and Neuro-Adaptation

Despite systemic constraints, the empirical evidence demonstrates an emerging "pedagogical metamorphosis" a shift away from classical, teacher-centered lecturing toward neuro-adaptively scaffolded instruction. The successful interventions documented in the reviewed studies operate by deliberately reducing extraneous cognitive load while supporting working memory:

Multisensory Neuropedagogy and VAK Integration: Interventions incorporating physical movement, tactile media (such as Busy Books), and visual-auditory dual coding ground abstract concepts in concrete physical experiences. Under Paivio's Dual-Coding Theory and neuroeducational principles, engaging multiple sensory channels simultaneously distributes cognitive processing across distinct visual and auditory sub-systems, expanding functional working memory capacity.

Concrete-Representational-Abstract (CRA) Progressions: In foundational literacy and mathematics, interventions utilizing the CRA sequence [20] provide structured cognitive scaffolding. Moving from physical manipulatives to visual representations before introducing symbolic notation allows slow learners to build robust schema gradually, mitigating cognitive strain.

Digital Gamification and Anxiety Mitigation: The deployment of low-stakes digital platforms (e.g., Wordwall) alters the affective filter of slow learners. Immediate visual feedback and gamified reward structures increase dopamine release, sustaining focus beyond the typical 20-minute threshold while alleviating test-taking anxiety.

3. The Pathology of Assessment: Superficial Compliance vs. Substantive Modification

A critical finding of this review is the structural imbalance in how inclusive schools evaluate slow learners. In 66.7% of the reviewed cases, schools resort to superficial administrative compliance—such as arbitrarily lowering passing grade thresholds (KKM/KKTP) or enforcing automatic grade promotion—rather than providing substantive pedagogical adaptations.

This practice creates an "illusion of inclusion". While lowering score cut-offs protects schools administratively and prevents grade retention, it leaves the underlying cognitive deficit unaddressed.

Students advance through grade levels without acquiring foundational literacy and numeracy skills, compounding their academic lag over time.

Substantive evaluation adaptations such as developing Individualized Education Plans (IEPs/PPIs), conducting ipsative progress tracking, offering 25–50% extra testing time, and simplifying exam language remain rare in practice. The primary barrier to implementing substantive assessment is structural: general classroom teachers, burdened by large class sizes and administrative workloads, lack the specialized training and institutional support required to design and manage differentiated evaluation instruments without dedicated assistance.

4. Ecological Friction: Bronfenbrenner's Systems Analysis

Applying Bronfenbrenner's Ecological Systems Theory demonstrates that classroom-level pedagogical innovations (microsystem) are constrained by systemic friction across broader ecological layers:

Table 6. Multi-Level Ecological Analysis of Slow Learner Education in Indonesia

Ecological Level	System Domain & Core Focus	Primary Ecological Friction / Barriers	Systematic Impact & Operational Reality
Microsystem	Classroom Environment & Direct Instructional Interactions	<ul style="list-style-type: none"> High-density classrooms (30–40 pupils) Rapid working memory fatigue (<20-min limit) Dominance of abstract, text-dense lecturing 	Triggers cognitive overload, behavioral withdrawal, and "spatial inclusion with instructional neglect."
Mesosystem	Home-School Synergy & Stakeholder Communication	<ul style="list-style-type: none"> Widespread parental denial driven by social stigma Resistance to formal ABK identification Lack of structured home-learning routines 	Disrupts continuity of learning support between home and school, undermining classroom scaffolding.
Exosystem	Institutional Infrastructure & Resource Allocation	<ul style="list-style-type: none"> Acute shortage of Special Assistant Teachers (GPKs) Absence of dedicated Resource Rooms (Ruang Sumber) Zero regional budget allocations for support staff 	Overburdens general educators, making individualized support and IEP implementation unsustainably difficult.
Macrosystem	Educational Policies & Socio-Cultural Norms	<ul style="list-style-type: none"> Contradiction between inclusive rhetoric and standardized testing Content-heavy curriculum expectations Socio-cultural deficit views of borderline IQ 	Incentivizes schools to prioritize uniform curriculum coverage over adaptive instruction, driving superficial grading fixes.

Mesosystemic Friction (School-Family Nexus): The synergy between home and school is frequently disrupted by parental denial. Driven by social stigma and limited awareness of special educational needs, parents often resist formal identification or refuse special accommodations for their children. This breakdown prevents consistent reinforcement of learning routines at home, undermining classroom interventions.

Exosystemic Friction (Institutional Support Infrastructure): The most severe systemic bottleneck is the acute shortage of Special Assistant Teachers (GPKs). Most inclusive primary schools operate without certified GPKs or dedicated Resource Rooms (Ruang Sumber) due to regional budget constraints. General educators are left to manage diverse learning needs independently, making individualized scaffolding difficult to sustain in high-density classrooms.

Macrosystemic Friction (Policy and Cultural Standards): At the macrosystemic level, there is a structural contradiction between national inclusive rhetoric and the reality of standardized performance metrics. While policy frameworks mandate inclusive education, school quality assessments remain tied to standardized academic benchmarks. This macro-level pressure incentivizes schools to prioritize curriculum coverage over adaptive instruction, driving the reliance on superficial administrative adjustments.

To bridge these gaps, inclusive education for slow learners must evolve from isolated teacher initiatives into an Integrated Ecological Support Model. This requires institutionalizing GPK positions with dedicated funding, mandating early cognitive screenings, reforming assessment policies to permit genuine curriculum adaptation, and establishing structured parental psychoeducation programs.

CONCLUSION

This systematic literature review of 15 verified, physically present empirical studies provides an authentic and traceable diagnostic of slow learner education in Indonesian inclusive primary schools. The

findings demonstrate that while local pedagogical innovations (differentiated instruction, neuropedagogy, CRA, and gamification) effectively mitigate the working memory and processing speed limitations of slow learners, their impact is severely constrained by a fragmented educational ecosystem. The prevailing reliance on superficial administrative adjustments (such as lowering KKM scores) over substantive pedagogical accommodations highlights a critical systemic vulnerability. True inclusive metamorphosis requires transitioning from isolated classroom-level strategies to an integrated, policy-backed ecological model of support.

Implications

Policy Implications (Exosystem & Macrosystem)

Mandate Early Cognitive Screening

Fund and mandate formal cognitive and developmental screenings at the transition to Grade 1 to prevent late, informal detection in Grades 3 or 4.

Institutionalize Special Assistant Teacher (GPK) Roles

Establish formal civil service career pathways (ASN/P3K) and dedicated regional budgets for GPKs to eliminate reliance on temporary, underpaid volunteer arrangements.

Flexible Curriculum Benchmarks

Formulate national guidelines authorizing schools to adapt passing standards (Capaian Pembelajaran/CP) for slow learners legally, freeing teachers from uniform milestones.

Practical Implications for Schools and Educators (Microsystem & Mesosystem)

Bridge the School-Parent Gap

Develop structured communication channels and parental psychoeducation programs to dismantle parental denial, improve special needs literacy, and align learning support between home and school.

School-Wide Capacity Building

Provide continuous professional development for general classroom teachers focusing on differentiated instruction, multisensory CRA approaches, and basic neuroeducation principles to manage cognitive load.

Co-Teaching Models

Foster formal collaboration between general teachers and GPKs to design Individualized Education Plans (IEPs/PPIs) and co-deliver differentiated lessons.

Substantive Assessments

Shift evaluation practices from lowering KKM to implementing diagnostic assessments, authentic portfolios, and testing accommodations (e.g., 25–50% extra time, simplified phrasing, and oral testing).

Future Research Directions

Longitudinal Transition Studies

Investigate the academic, social, and emotional transitions of slow learners as they progress from primary to secondary education settings in Indonesia.

Gamification and Cognitive Load

Conduct experimental research evaluating the direct impact of gamified digital media (e.g., Wordwall) on the specific working memory limitations and cognitive load of slow learners.

GPK Intervention Evaluations

Perform mixed-method evaluations of GPK support models in rural versus urban inclusive schools to identify best practices for resource allocation.

ACKNOWLEDGMENTS

The authors express their sincere gratitude to the Department of Islamic Elementary Teacher Education at State Islamic University Antasari Banjarmasin and State Islamic University Sunan Kalijaga Yogyakarta for academic and institutional support throughout this research.

REFERENCES

- [1] Badan Standar, K. dan A. P. K. P. K. P. K. R. dan T., Panduan Penyelenggaraan Pendidikan Inklusif di Sekolah Dasar. Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi. 2022.

- [2] D. E. Mandagani, Z. N. Khusnaini, N. I. Aryati, S. Prasetyo, and I. Kamala, "Karakteristik dan Proses Pembelajaran Siswa Slow Learner," *At-Tarbawi: Jurnal Pendidikan, Sosial Dan Kebudayaan*, 9(1), 46–59. doi: 10.32505/tarbawi.v9i1.4136, 2022.
- [3] Lora Septiana, Jesi Alexander Alim., and Hendri Marhadi., "Identifikasi Peserta Didik Berkebutuhan Khusus (PDBK) Slow Learner di Sekolah Dasar," *Concept: Journal of Social Humanities and Education*, 3(4), 189–211. doi: 10.55606/concept.v3i4.1647, 2024.
- [4] B. Hatimatussaadah, "Implementasi Kurikulum Merdeka dalam Pembelajaran Inklusif di Sekolah Dasar: Studi Kasus di NTB," *Jurnal Pendidikan Terintegrasi*, 1(1), 2025–2063. doi: 10.63982/xxxxxxx, 2025.
- [5] U. Bronfenbrenner, *The Ecology of Human Development: Experiments by Nature and Design*. Harvard University Press. 1979.
- [6] M. J. Page, J. E. McKenzie, P. M. Bossuyt, I. Boutron, T. C. Hoffmann, C. D. Mulrow, L. Shamseer, J. M. Tetzlaff, E. A. Akl, S. E. Brennan, R. Chou, J. Glanville, J. M. Grimshaw, A. Hróbjartsson, M. M. Lalu, T. Li, E. W. Loder, E. Mayo-Wilson, S. McDonald, and D. ... Moher, "The PRISMA 2020 statement: an updated guideline for reporting systematic reviews," *BMJ*, n71. doi: 10.1136/bmj.n71, 2021.
- [7] T. Saifuddin, W. Bin Dilshad, S. Ishrat, K. Shahzadi, and M. Altamash, "Multigrade Teaching, a Remedial Step for Slow Learners in an Inclusive Setup," *International Journal of Contemporary Issues in Social Sciences*, vol. 3, no. 3, pp. 1899–1903, 2024.
- [8] N. R. Zulkifli, N. A. Mat Zin, and R. A. Majid, "Gamification Design for Teaching Numeracy to Slow Learners," *International Journal of Innovative Technology and Exploring Engineering*, vol. 8, no. 8S, pp. 215–220, 2019.
- [9] T. Sumiati and S. Gumiandari, "Pendekatan Neurosains dalam Strategi Pembelajaran untuk Siswa Slow Learner," *Risalah: Jurnal Pendidikan dan Studi Islam*, vol. 8, no. 3, pp. 1050–1069, 2022, doi: 10.31943/jurnalrisalah.v8i3.326.
- [10] S. Sugiarti and I. Islawati, "Analysis of Inclusive Education Based on Local Wisdom in a Global Perspective: Factors of Implementation and Integration: A Systematic Literature Review," *Indo-MathEdu Intellectuals Journal*, vol. 7, no. 3, pp. 3411–3425, 2026, doi: 10.54373/imeij.v7i3.5342.
- [11] Y. F. Isnaini, M. Minsih, C. Widayari, and H. Helzi, "Differentiated Learning Strategies by Guru Penggerak: Accommodating the Needs of Slow Learner in Primary School," *AL-ISHLAH: Jurnal Pendidikan*, 17(3). doi: 10.35445/alishlah.v17i3.7052, 2025.
- [12] E. N. Hafizah, *PEMBELAJARAN BERBASIS NEUROPEDAGOGY UNTUK MENINGKATKAN SELF-ESTEEM DAN PEMAHAMAN KONSEP IPAS PADA SISWA SLOW LEARNER DI KELAS 3 SEKOLAH DASAR*. UIN Sunan Kalijaga . 2026.
- [13] F. A. Husniyah, *Pendekatan Individual Untuk Siswa Slow Learner di MINU Hidayatul Muftadi'in Bumiayu Malang*. Universitas Islam Negeri Maulana Malik Ibrahimi. 2024.
- [14] S. Ru'iyah, H. C. A. Kistoro, S. Sutarman, and Y. Masduki, "Model of Religious Education for Slow Learner Children in Inclusive Schools in Indonesia," *Jurnal Ilmiah Peuradeun*, 11(2), 475–494. doi: 10.26811/peuradeun.v11i2.861, 2023.
- [15] I. Kamala and H. Minhalina, "Science Learning for Slow Learner Students in Indonesia," *Science Learning for Slow Learner Students in Indonesia*. Thabiea : *Journal of Natural Science Teaching*, 5(2), 161–173. <http://journal.iainkudus.ac.id/index.php/Thabiea>, 2022.
- [16] S. D. Ariyanti, S. D. Putra, F. Zuhria, and D. Y. Rahayu Sulistiyawati, "Teacher Challenges In Teaching Slow Learners," *ALENA : Journal of Elementary Education*, 3(2), 199–208. doi: 10.59638/jee.v3i2.372, 2025.
- [17] S. Nurfadhillah, S. N. Faziah, S. N. Fauziah, F. S. Nupus, N. Ulfi, F. Fatmawati, and S. Khoiriah, "Analisis Strategi Guru dalam Mengajar Siswa Lambat Belajar atau Slow Learner di Kelas II SDN Kunciran Indah 7," *MASALIQ*, 2(1), 53–63. doi: 10.58578/masaliq.v2i1.92, 2022.
- [18] D. A. Lestari, "IMPLEMENTASI PENDIDIKAN INKLUSI PADA SISWA SLOW LEARNER DI MI AN-NAZWA CIKEUSAL KABUPATEN SERANG," *Jurnal Anak Bangsa*, 2(1), 146–157. doi: 10.46306/jas.v2i1.35, 2023.
- [19] S. Oktavianita and W. Wahidin, "Gestur Siswa Slow Learner dalam Belajar Matematika Menggunakan Aplikasi Wordwall di Sekolah Dasar," *Jurnal Basicedu*, 6(3), 4802–4811. doi: 10.31004/basicedu.v6i3.2941, 2022.
- [20] H. Hafidah and R. Rukli, "Treatment Slow Learner Learning Repetitive Addition with Realistic Mathematics Learning Approach," *Mimbar Sekolah Dasar*, 9(3), 396–412. doi: 10.53400/mimbar-sd.v9i3.48586, 2022.
- [21] B. E. H. Cahyono, D. N. Asri, and R. P. Trisnani, "Vocabulary learning for slow learner students in inclusive elementary schools: A case of Magetan Regency, East Java, Indonesia," *Research Journal in Advanced Humanities*, 5(1), 209–222. doi: 10.58256/e4hejt58, 2024.
- [22] S. Nurhaliza, M. Mashun, and D. B. Maritasari, "Pengembangan Media Bussy Book Calistung Untuk Siswa Slow Learner Kelas 1 di SDN 3 Lendang Nangka," *Jurnal Ilmiah Profesi Pendidikan*, 8(3), 1554–1559. doi: 10.29303/jipp.v8i3.1534, 2023.
- [23] Ryandi, Ecce, S., Saifullah., and Hanafi, M., "ANALISIS KESULITAN BELAJAR BAHASA INDONESIA PADA SISWA: FOKUS PADA SLOW LEARNER DI SD," *Jurnal Ilmiah Pendidikan Citra Bakti*, 12(1), 81–93. doi: 10.38048/jipcb.v12i1.4857, 2025.
- [24] M. Sururuddin, A. Aziz, and A. Aziz, "Strategi Pembelajaran Poll Out Untuk Menarik Minat Belajar Siswa Slow Learner SDN 2 Labuhan Haji Pull-put, slow learner," *SPECIAL Special and Inclusive Education Journal*, 3(2), 2022.
- [25] A. Mukhlis, B. Kirana Nur Haida, and A. Auliya Nurani, "Special Assistance Teachers Learning Strategies for Slow Learner Students in Inclusive Elementary Schools," *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, 7(1), 158. doi: 10.24036/jippsd.v7i1.122424, 2023.