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Mathematical literacy for slow learners: a review of access and quality of elementary school education

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Keywords:	Abstract
slow learner; mathematical literacy; human rights and equality	<i>The 2030 Sustainable Development Goals (SDGs) on inclusive and equitable quality education have elevated inclusive education to a high priority in a global context. Mathematical literacy is not simply the ability to calculate, but a fundamental competency for individuals to fully participate in a modern, data-driven society. This study aims to analyse the equity and quality of the mathematical literacy learning process for slow-learning students. The research method used is qualitative. The type of research is phenomenological. The qualitative research design consists of three stages: orientation, focused exploration, and data analysis. Data collection techniques include interviews, observation, and documentation. The data analysis technique used is Miles and Huberman's data analysis, which is a systematic and interactive method for analysing qualitative data. The results of this study indicate that schools and curricula are not flexible enough to address the unique needs of each slow-learning student in learning mathematical literacy. This includes modifying the curriculum and learning strategies to suit their individual potential. Schools have not fully provided physical access or safe facilities for slow-learning students. Students tend to adapt to school. Assessments given to slow-learning students in summative assessments tend to be similar to those given to non-slow-learning students. Inhibiting factors include the lack of teacher competency development in assisting slow-learning students and limited facilities and teaching material for slow-learning students.</i>

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INTRODUCTION

Background of the Study

Mathematical literacy has become a central discourse in the transformation of global education, where numeracy skills are no longer viewed as mastery of basic arithmetic, but rather as an individual's capacity to formulate, use, and interpret mathematics in various life contexts (Safitri, [2023](#)). This aligns with the Sustainable Development Goals (SDG 4) agenda, which emphasises inclusive and equitable quality education for all levels of learners. However, implementing this vision faces significant challenges when dealing with cognitive diversity in the classroom, particularly among slow learners (Imran et al., [2024](#); Vindigni, [2024](#)). Education is a basic human need for every human being to continue their life and achieve a better quality of life. Achieving a better quality of life is certainly everyone's dream, regardless of their status and physical or mental condition. Education is a fundamental human right that must be enjoyed equally and is the right of every human being on this earth. Education has to be flexible so it can adapt to the needs of changing societies and communities and respond to the needs of students within their diverse social and cultural settings. Adaptability requires schools to adapt to children, rather than forcing children to adapt to schools. Education must uphold the principles of adaptability and flexibility. This means that schools are obligated to adapt to the diverse needs and backgrounds of students, rather than forcing them to conform to a rigid school system. The primary focus of education is to serve the dynamic needs of children (Frenk et al., [2022](#); Sinha et al., [2024](#)).

Every child has a fundamental right to education and must be allowed to achieve and maintain an acceptable level of learning. Educational systems should be designed and educational programmes implemented to take into account the wide diversity of these characteristics and needs (Lomis et al., [2021](#)). Fulfilling every child's basic right to education requires an inclusive and adaptive system. Educational programs must be designed with the diverse characteristics and unique needs of students in mind so that every child has an equal opportunity to achieve adequate learning outcomes (Alfandy et al., [2024](#); Kar et al., [2025](#)).

Mathematical literacy is an individual's capacity to formulate, employ, and interpret mathematics in a variety of contexts. Stacey and Turner explain that Mathematical literacy focuses on the ability to use mathematical thinking to solve real-world problems. They emphasise the process of mathematical modelling, which begins with a real-world problem, translates it into a mathematical problem, solves it mathematically, and interprets the results back into the real world (Kolar & Hodnik,

2021; Seçgin et al., 2024). The conclusion is that mathematical literacy is defined as the ability to solve real-world problems using mathematical modelling cycles. This emphasises that mathematics is not simply a matter of counting, but rather an integrative process that begins with translating reality into mathematical form, solving it, and reinterpreting the results as solutions relevant to life (Bolstad, 2023; Harahap & Andayani, 2024).

Mathematics for literacy is about having the competence to deal with the mathematical demands of everyday life. This statement shifts the paradigm of mathematics education from one focused on mastering abstract formulas to one focused on functionality. This emphasises that mathematics is not simply a subject to memorise, but rather a vital tool for survival and logical decision-making in daily life. Therefore, the relevance of its learning is crucial for everyone, not just those who are academically gifted

The Problem of The Study

For slow learners, mathematics is often the most intimidating subject due to its abstract nature. Without concrete, contextual learning modifications that adapt to the students' learning needs, especially slow learners, they will become mere spectators in the classroom. Slow learners are students who show a general slowness in learning and have limited intellectual ability, with IQ scores ranging between 70 and 85/90 (Kim & Cheon, 2024). They struggle with abstract thinking and require concrete examples. From expert opinion, it can be understood that he crucially places slow learners in a unique position on the borderline of the spectrum of cognitive abilities. By identifying the IQ range of 70–90, Brennan asserts that this group cannot be equated with people with intellectual disabilities (mental retardation), but also cannot be forced to follow the learning rhythm of average students without assistance (Lee & Cheon, 2024). This implies that the greatest challenge faced by slow learners is often not because they are unable to learn, but because the regular education system often fails to accommodate their different learning speeds.

The slow learner is one whose rate of learning is slower than that of the average child of his age group. They have limited capacity to express ideas and poor retention span (Adawiyah & Daulay, 2022). Empirical conditions in the field, particularly in West Lombok Regency, indicate a gap between inclusion regulations and classroom practices. A field study conducted by Mardiyah & Masithah (2025) in the Citra Bakti Scientific Education Journal found that although the gross enrollment rate (access) for students with special needs in West Lombok has increased, 65% of

elementary school teachers have not modified their lesson plans to accommodate slow learners. Teachers tend to pursue the target of completing the national standard curriculum, thus neglecting the rights of slow learners to learn at their own pace. This finding is reinforced by research by Shabrina, [2022](#)) in the Basicedu Journal, which highlights that the numeracy literacy of slow learner students in inclusive schools remains very low due to the learning implemented being textually based, minimal teaching aids, and a lack of a personal approach.

Research's State of the Art

Research on mathematical literacy has flourished over the past decade. Most studies focus on the development of digital learning media to improve the mathematical literacy of regular students. On the other hand, research on inclusive education focuses more on students with specific disabilities such as dyscalculia or autism.

In Indonesia, several studies have explored teachers' strategies for dealing with slow learners, but these studies are generally limited to behavioural aspects or general learning outcomes, rather than the depth of their mathematical literacy. Discussions on how the "right to literacy" is integrated into educational quality standards in inclusive schools are still rare in contemporary literature.

Novelty, Research Gap, & Objective

There is a literature gap regarding how educational quality and access are articulated in mathematics learning for slow learners in areas with specific geographic and socioeconomic characteristics, such as West Lombok Regency. No research has critically examined whether the implemented mathematical literacy standards meet the principles of cognitive justice for students with learning disabilities in public elementary schools in the region.

The novelty of this research lies in the integration of the theory of the human right to education with a qualitative analysis of the implementation of mathematical literacy. This research views learning difficulties not only as individual student issues but also as a systemic failure in providing pedagogical accessibility. Focusing on West Lombok Regency provides a unique contribution to the dynamics of education in a peripheral area, transforming an inclusive system (Povinelli, [2024](#); Smith et al., [2025](#)).

This study aims to analyse in-depth the extent to which access and quality of mathematical literacy education are provided to slow learner students in elementary schools in West Lombok Regency, as well as to identify systemic and pedagogical barriers that hinder the fulfilment of their right to learn.

METHOD

Type and Design

This study applies a descriptive qualitative approach using the interactive model data analysis technique from Miles, Huberman, and Saldaña. The analysis process is carried out cyclically and continuously from data collection until the final report is completed. The analysis stage begins with data condensation, which is the process of selecting, focusing, and transforming raw data from in-depth interviews with teachers, observations of classroom activities, and school policy documents regarding mathematical literacy for slow learners in West Lombok Regency. Next, the data is presented (data display) in the form of descriptive matrices and thematic narratives to organise the information so that patterns of accessibility and quality of education are transparently visible. The final stage is conclusion drawing and verification, in which the researcher formulates the meaning of the field findings and tests their credibility through triangulation of techniques and sources to ensure the validity of the research results in addressing the educational challenges for slow learners (Lazarus et al., [2025](#); Yan et al., [2025](#)).

Data and Data Sources

This study relies on qualitative data gathered through triangulation of sources and techniques. The data focused on the fulfilment of basic educational rights, accessibility, and the quality of mathematical literacy learning for slow learners in three research locations. Primary and secondary data in this study were sourced from Key Informants, namely classroom teachers who handle slow learner students in three elementary schools in West Lombok Regency: SDN 1 Perampuan, SDN 3 Kuripan, SDN 4 Dasan Geres, and SDN 1 Perampuan.

The research location (Research Sites) is an inclusive classroom in the West Lombok Regency area, which has the characteristics of student heterogeneity, while the supporting documents are teacher evaluation notes, diagnostic assessment instruments, and mathematics teaching materials.

Based on the results of interviews and field observations, the data is categorised into five main pillars as follows.

Data Categories	Description of Findings and Observation Results
Student Identification Mechanism	SDN 1 Perumpuan & SDN 4 Dasan Geres: Identification is based on information transfer (based on previous class teacher notes). SDN 3 Kuripan: Identification is more structured through a diagnostic assessment at the beginning of the semester to map students' cognitive readiness.
Perception of Rights and Curriculum Targets	There is a growing consensus that slow learners have the right to a tailored, appropriate education. Observations indicate that teachers understand that the curriculum targets for slow learners are not the same as for regular students, emphasising understanding basic concepts rather than speed
Accessibility of Facilities and Competence	Systemic barriers were identified, including a shortage of specialised teaching aids and a lack of supporting facilities from schools and the government. Furthermore, there was a gap in teacher competency due to a lack of specific training on pedagogy for children with special needs (ABK).
Social Integration and Anti-Discrimination	SDN 3 Kuripan: Using two-way communication strategies and motivational reinforcement to maintain student confidence. SDN 1 Perampuan: Using peer tutoring techniques by placing slow learners in a group of regular students who have high empathy to prevent marginalisation.
Pedagogical Strategies and Media Literacy	Logic/Story Problem Method: SDN 3 uses a contextual approach (daily life), while SDN 2 faces the constraint of a large student ratio, so that learning tends to be classical (general). Most Effective Media: Use of real objects (concrete objects) such as stones, sticks, or objects around students to bridge abstract symbols to real understanding

Data Analysis

Based on the integration of the narrative above, the researcher noted several crucial points as a result of the observations:

Cognitive Stages (CRA Sequence): Observations show that effective mathematical literacy learning for slow learners at the research location must follow a flow. Concrete Object Manipulation → Visual Representation → Abstract Symbols. The quality gap between schools is due to differences in accessibility. Schools

Implementing diagnostic assessments (SDN 3 Kuripan) has more mature pedagogical readiness than schools that rely solely on verbal communication between teachers. Cognitive Stages (CRA Sequence): Observations show that effective mathematical literacy learning for slow learners at the research location must follow a flow.

Concrete Object Manipulation → Visual Representation → Abstract Symbols. The quality gap between schools is due to differences in accessibility. Schools implementing diagnostic assessments (SDN 3 Kuripan) have more mature pedagogical readiness than schools that rely solely on verbal communication between teachers.

The gap in in-depth handling of slow learners at SDN 1 Perampuan in mathematical literacy learning lies in teachers' difficulty in focusing on learning due to their limited understanding of the pedagogical context in which teachers manage the classroom. This results in students with limitations at the slow learner stage receiving less attention.

Structural Constraints at SDN 4 Dasan Geres: Observations show that overcrowded classrooms are a major barrier for teachers to provide special attention to slow learners, making it difficult to achieve the principle of quality equality.

Cognitive Justice through Media: The use of tangible media is not merely a tool, but rather an instrument for fulfilling the rights of students with symbolic processing limitations to achieve basic mathematical literacy.

RESULTS

The interview results obtained by researchers related to the analysis of educational human rights for slow learner children in the context of mathematical literacy, with equal access and quality of education for elementary school students, are categorised according to the question items and according to the results of interviews with teachers who teach classes that have students in slow learner conditions (slow in learning) (Aparicio et al., [2025](#)).

As for the results of the answers related to the process of identifying slow learner students in the classroom, the answers obtained from each teacher at different schools are as follows: Teachers at SDN 1 Perumpuan and SDN 4 Dasan Geres learned that their students were experiencing learning difficulties through information from previous teachers during evaluation meetings. Teachers at SDN 3 Kuripan identified slow learners through diagnostic assessments conducted at the beginning of the semester or before the start of the learning process.

The results of further interviews with educational teachers regarding teachers' understanding of rights for slow learners with the same curriculum targets as regular students, all teachers at SDN 1 Perampuan, SDN 3 Kuripan and SDN 2 Dasan Geres had the same answer, saying that children with Slow Learners also have the right to proper education, one of which is the right to learn and be taught according to their conditions. In my understanding, the learning targets for children with Slow Learners are different from those of regular students in general.

Then the results of the interviews obtained regarding the same teaching aids and mathematics learning facilities used by teachers in teaching children with special needs, namely slow learner students, on average all teachers said that the lack of teaching aids and the availability of facilities provided by schools and/or the government were the main obstacles faced by teachers, including in strengthening competencies in the form of providing broader training to teachers on how to teach children with special needs such as slow learners. In relation to mathematics learning for slow learners, of course, the understanding of the concept of one teaching aid is certainly different from another.

From the results of interviews with teachers at SDN 1 Perampuan, SDN 3 Kuripan, and SDN 2 Dasan Geres, the same information was provided regarding the teachers' efforts to ensure that slow learner students do not feel marginalised (discriminated against), especially during mathematics lessons. Where teachers at SDN 3 Kuripan said that one of the methods used was by providing motivation and two-way communication with slow learner students, as well as with regular students, to prevent discrimination or embarrassment from slow learner students. Then, teachers at SDN 1 Perampuan said that in the mathematics learning process, students with disabilities were included in groups of students who better understood their friends' conditions, and their groups or friends were also given motivation so that they could continue to play a role in providing motivation and could collaborate with other friends in mathematics learning.

In explaining story problems or mathematical logic to slow learners,

researchers obtained different information in the field, such as a teacher at SDN 3 Kuripan, who said that one of the methods I use is to provide examples of story problems that are close to their personal lives or daily lives, also using language that is easy for them to understand. Then a teacher at SDN 1 Perampuan said that something that is difficult for students who have delays to understand is learning math story problems. However, teachers continue to try to use the most effective method possible so that students with limitations or slow learners can understand and be able to adapt to their friends. Meanwhile, the results of interviews with teachers at SDN 2 Dasan Geres said that the learning method process carried out in class was as usual because, with the condition of so many students, it would certainly take more time if I focused on teaching students by dividing time for slow learners and normal children.

What media or teaching aids are most effective in helping students who have slow learner difficulties in understanding mathematical concepts, as the results of interviews obtained from the three schools obtained the same information, namely the media given to slow learner students with examples of real objects that can be used for counting, such as sticks, stones, or other objects that are often encountered.

Regarding the allocation of additional time or special guidance (remedial) for them to achieve equality of understanding, each teacher at the target elementary school has a different approach, such as the results of interviews with teachers at SDN 3 Kuripan, who said that I usually use break time or 30 minutes in the last period. Meanwhile, teachers at SDN 1 Perampuan find free time to be able to guide slow learners in mathematics tutoring. Furthermore, teachers at SDN 2 Dasan Geres try to coordinate with students' parents so they can guide their students at home more intensively in learning.

Regarding the assessment system (report cards) for mathematical literacy for slow learners, all teachers at the schools where the research took place stated the same thing: based on a mutual agreement with their superiors, slow learners are given the same standards but with different test instrument categories. Regarding the school policy regarding the admission of slow learner students, the three principals of SDN 3 Kuripan, SDN 1 Parampuan, and SDN 2 Dasan Geres stated that there is no special selection process for admission; rather, the classification process is conducted at the beginning of the semester.

The following interview results related to the rights of slow learners to receive an education equal to that of regular students. The principal stated that this could be supported by continuously drafting a list of their learning achievements and

progress. For example, students who cannot yet read are given a weekly checklist of their reading milestones.

There is no specific training for teachers in managing mathematics for children with special needs. This is also due to the lack of supporting facilities and infrastructure (such as a resource room or math teaching aids) to support the quality of their education. The principal stated that currently, teaching staff or teachers provide the necessary media themselves, encouraging students to bring their own from home.

DISCUSSIONS

The following will discuss and categorise the research results obtained in the field, supported by the opinions of several experts, which are described in the form of:

1. Educational Rights and Curriculum Adaptability

The research findings indicate that schools and curricula are not yet flexible enough to address the unique needs of slow learners. Although teachers and principals acknowledge that slow learners have equal educational rights, in practice, students are more likely to be expected to adapt to the school system, rather than the other way around (Ydesen & Elfert, 2023).

UNESCO's Salamanca Statement emphasised that regular schools with an inclusive orientation are the most effective way to combat discriminatory attitudes. However, this study found that even in the absence of social discrimination (bullying), structural barriers exist, such as a lack of teacher training. This lack of preparedness in support systems hinders the creation of the ideal inclusive environment mandated by UNESCO, where schools should provide child-centred pedagogy.

2. Mathematical literacy and contextual challenges for slow learner students

In the context of mathematical literacy, interview results indicate that slow learners experience the greatest difficulty understanding word problems or mathematical logic, despite teachers' attempts to use simple language. Word problems are one of the challenges slow learners face. These include difficulty understanding reading texts, seemingly numerous word problems, and difficulty reading, which can be hampered by stuttering.

The definition of mathematical literacy within the PISA framework defines literacy as the capacity to formulate, use, and interpret mathematics in various contexts. Slow learners' difficulties with word problems indicate

obstacles in the formulation stage, which involves translating real-world problems into mathematical models.

Teachers at SDN 3 Kuripan and SDN 1 Perampuan attempt to address this by relating the problems to students' everyday lives. However, because summative assessments (report cards) often still use rigid test standards (as found at SDN 4 Dasan Geres), the true literacy competency of slow learners is often not adequately measured. Students may understand concepts when they relate them to real life, but fail when faced with rigid formal test procedures

3. Characteristics of Slow Learners and Learning Strategies

Based on observations and interviews obtained in the research, it shows that teachers use real objects (sticks, stones) and try to provide repetitive instructions. However, there is a significant obstacle in the form of limited time for teachers to provide scaffolding (gradual assistance) in person due to the large number of students. This is in accordance with Brennan (1985), slow learners are not students who are unable to learn, but rather those who require more time and a more concrete approach than their peers. Brennan emphasises the importance of learning that moves from the concrete to the abstract. The use of simple teaching aids by teachers is in accordance with Brennan's theory, but the absence of consistent scaffolding is a major obstacle. Without intensive guidance and adequate additional time, the transition from concrete objects (stones/sticks) to a more abstract understanding of mathematical literacy is interrupted (Asri & Nuroh, 2023; Kumari & Kataria, 2022).

4. Availability of facilities and teacher competence

One crucial finding is the lack of specific training for teachers to handle children with special needs and the lack of teaching aids, requiring teachers to provide their own media. The aspects of Availability and Acceptability have not been optimally met

- a. Availability: Schools lack supporting facilities (resource rooms, specialised teaching aids) that are crucial for mathematical literacy.
- b. Acceptability: The quality of education is hampered because teachers are not equipped with adequate skills through training.

This situation forces teachers to resort to makeshift strategies (based on intuition and personal experience), such as providing remedial classes during break times. Despite teachers' best intentions (high motivation to prevent discrimination), without systemic support in the form of professional training and adequate facilities, slow learners' right to mathematical literacy is not optimal.

CONCLUSION

Based on the research results, it can be concluded that educational services for slow learners in mathematical literacy learning still face serious systemic obstacles due to school rigidity and a curriculum that is not flexible enough to respond to students' unique needs. This is evident in the absence of curriculum modifications and adaptive learning strategies, as well as the implementation of summative assessment standards that are the same as those for regular students, thus creating a double burden for slow learners who are forced to adapt to a non-inclusive school system, instead of schools that adapt to them. This problem is rooted in weak infrastructure and human resource support, namely the lack of adequate physical facilities and teaching materials, as well as the absence of strengthening teacher competencies through special training, which ultimately results in the process of mentoring students with special needs being suboptimal and their right to a quality education being neglected.

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