E-ISSN 3048-1554 Vol. 3, Issue 1 (2025)
Doi: https://doi.org/10.37899/mjdl.v3i1.307

Mauve Journal De Leardu

Implementation of the Literacy and Numeracy Habituation Program to Improve Students' Basic Competencies

Mirajul Wathoni Az-Zuhudi[1], Muh Deni Siregar[1], Novina Anjalina Nur Anisa[1], Fathimatuzzuhro Lathif[1], Herlina Yanti[1], Hikatun Fatmariza[1]

[1]*Elementary School Teacher Education, Faculty of Education, Universitas Hamzanwadi, Indonesia*

**Corresponding Author: Mirajul Wathoni Az-Zuhudi*
E-mail: mirajulwathoni02@gmail.com

Article Info

Article History:
Received: 10 November 2025
Revised: 12 January 2026
Accepted: 27 January 2026

Keywords:
Adaptive Teaching
Elementary Education
Literacy Development
Numeracy Skills

Abstract

This study aims to analyze the implementation of a Literacy and Numeracy Habituation Program (Bias Litnum) and its impact on students' foundational competencies in an elementary school context. A qualitative descriptive approach was employed, involving classroom observations, semi-structured interviews, and document analysis to capture instructional processes and student learning experiences. The findings reveal that the program, implemented through routine, contextual, and student-centered activities, contributes to improvements in reading comprehension, writing skills, and numeracy reasoning. The results also indicate that adaptive teacher facilitation and supportive learning environments play a critical role in enhancing student engagement and participation. The novelty of this study lies in its integrated analysis of literacy and numeracy within a habituation-based framework, highlighting the interaction between routine practice, contextual learning, and student engagement as key mechanisms for developing foundational competencies. The study provides both theoretical and practical implications by proposing a holistic approach to literacy and numeracy development that goes beyond traditional instructional models. These findings suggest that habituation-based programs can serve as an effective and sustainable strategy for improving basic competencies in elementary education.

INTRODUCTION

Basic education plays a pivotal role in shaping human capital by providing foundational competencies that enable individuals to participate effectively in social, economic, and intellectual life. Among these competencies, literacy and numeracy are universally recognized as core skills that underpin learning across disciplines and throughout the life course. Literacy, in contemporary educational discourse, extends beyond the ability to decode written text; it encompasses higher-order competencies such as comprehension, interpretation, critical evaluation, and communication in diverse contexts (Sinaga et al., 2023; Wulandari, 2026; Aziz & Rawian, 2022). Similarly, numeracy is not limited to computational proficiency but

involves the capacity to apply mathematical reasoning, interpret quantitative information, and solve real-world problems (Díez-Palomar et al., 2023; Tuong et al., 2023). In the twenty-first century, these competencies are increasingly essential for navigating complex information environments, supporting critical thinking, and fostering adaptive decision-making in rapidly changing societies (Asrifan et al., 2025; Panda & Kaur, 2024).

The global emphasis on literacy and numeracy is strongly reflected in international large-scale assessments such as the Programme for International Student Assessment (PISA) and the Progress in International Reading Literacy Study (PIRLS). These assessments consistently demonstrate that early mastery of literacy and numeracy is a strong predictor of long-term academic achievement and lifelong learning outcomes (Chang, 2023; Andriani et al., 2025; Lechner, 2023). Students who develop strong foundational skills at the primary level tend to exhibit higher-order thinking abilities, greater learning autonomy, and improved performance across subject areas (Abidin et al., 2020). Conversely, students who fail to achieve basic proficiency in literacy and numeracy are at risk of cumulative learning deficits, which may widen educational inequalities and limit future opportunities (Betthäuser et al., 2023; Marks et al., 2022). Consequently, strengthening literacy and numeracy in elementary education has become a central agenda in educational reform worldwide (Sthapak et al., 2024).

Although this is a global priority, there is empirical evidence that literacy and numeracy activities in most developing settings, such as the case in Indonesia are below optimum. According to national and international assessment data, a notable percentage of elementary schoolchildren in Indonesia are yet to achieve minimum scores in reading comprehension and basic mathematics (Prabowo et al., 2023; Kurniaman et al., 2025). These results suggest systemic issues with regard to instructional strategies, little exposure to rich learning experiences, and lack of integration of literacy and numeracy in routine classroom practices. Moreover, traditional methods of teaching tend to focus on procedural and memorization learning, which can slow down the process of building more conceptual knowledge and a critical thinking capacity (Halabieh et al., 2022). Unless these problems are handled, they can compromise the success of further educational interventions and the preparedness of students to further education.

Educational policies have been responding to these challenges with an increased focus on more holistic and student-centered policies. In Indonesia, efforts have been underway like the School Literacy Movement (Gerakan Literasi Sekolah) and Merdeka Belajar framework to instigate the need to incorporate literacy and numeracy practices into day-to-day school life (Vito, 2025). Such initiatives promote meaningful, contextual, and continuous learning experiences that promote positive habits and intrinsic motivation among learners. It is based on the understanding that in the long-term, an experience of consistent participation in literacy and numeracy operations can foster the development of the underlying competencies in gradual stages, as well as fostering a culture of learning in the school environment.

In this policy environment, the concept of habituation-based methods has come out as a promising approach towards improving literacy and numeracy achievement. Habituation is the systematic and recurrent involvement of students in meaningful learning activities that are incorporated in their daily practices and are consistent with their developmental needs. According to previous research, consistent reading, writing, and contextual numeracy activities may enhance comprehension, solidify conceptual knowledge, and encourage the application of skills to real-life contexts (Rahayu & Firdaus, 2025; Sujatha & Vinayakan, 2023). Additionally, the programs based on habituation are especially useful in decreasing learning anxiety and

enhancing student engagement, because they produce a non-threatening and accommodating learning atmosphere.

Such programs, however, are immensely dependent on the teachers to be the facilitator of learning. Modern pedagogical theories support the idea that instructors must no longer assume the role of conventional teachers but rather become the architects of adaptive, inclusive, and responsive learning experiences that address the needs of learners (Ajani, 2024; Geetha, 2025). Empirical studies show that successful teaching of literacy and numeracy implies differentiated instruction, multimodal learning resources, and discussion and reflection, which are to be integrated to foster deeper learning (Fitria and Kurniawan, 2022). Moreover, cooperative teaching experiences, such as the presence of teaching assistants or outside educational resources, are also proven to facilitate instructional change and assist a variety of students (Abidin et al., 2020).

Although previous studies have demonstrated the potential of habituation-based literacy and numeracy programs, several limitations remain evident in the existing literature. First, many studies tend to focus on quantitative outcomes, such as test scores, without providing in-depth insights into the processes of program implementation and classroom dynamics. Second, there is limited exploration of how teachers operationalize habituation strategies in real classroom contexts, particularly in resource-constrained environments. Third, existing research often examines literacy and numeracy separately, whereas integrated approaches that combine both competencies within a unified framework remain underexplored. These gaps highlight the need for qualitative, context-sensitive studies that examine how habituation-based programs are implemented, how teachers facilitate learning, and how students respond to these interventions in authentic educational settings.

Addressing these gaps, this study investigates the implementation of the Literacy and Numeracy Habituation Program (Bias Litnum) in an Indonesian elementary school context. Unlike prior studies that primarily emphasize outcomes, this research adopts a qualitative approach to explore the processes, strategies, and interactions that underpin the program's effectiveness. Specifically, the study examines how the program is implemented in daily school routines, how teachers design and facilitate literacy and numeracy activities, and how students' engagement and competencies evolve over time. By focusing on the integration of literacy and numeracy within a habituation framework, this study contributes to a more holistic understanding of foundational learning practices.

The novelty of this research lies in three key aspects. First, it provides an integrated analysis of literacy and numeracy development within a single habituation-based program, offering a more comprehensive perspective than studies that treat these competencies separately. Second, it emphasizes the role of teacher facilitation and classroom interaction as central mechanisms in shaping learning outcomes, thereby moving beyond outcome-oriented evaluations. Third, it situates the analysis within a real-world school context, generating contextually grounded insights that are relevant for policy and practice in similar educational settings.

Therefore, this study aims to analyze the implementation of the Literacy and Numeracy Habituation Program (Bias Litnum), identify the strategies employed by teachers in facilitating learning activities, and examine its impact on students' literacy and numeracy competencies. The findings are expected to contribute theoretically to the literature on habituation-based learning and practically to the development of effective literacy and numeracy programs in elementary education, particularly within the context of ongoing educational reforms.

METHODS

Research Design

This study employed a qualitative descriptive research design to explore the implementation of the Literacy and Numeracy Habituation Program (Bias Litnum) and its contribution to students' basic competencies. A qualitative approach was selected as it enables an in-depth understanding of processes, interactions, and meanings constructed by participants within a natural educational setting. Qualitative descriptive design is particularly appropriate for examining instructional practices and student engagement in real classroom contexts (Quibrantar & Ezezika, 2023).

The study adopted an interpretive perspective, focusing on how teachers and students experience and construct meaning from literacy and numeracy activities. This approach allows for a comprehensive exploration of how habituation-based learning is implemented and how it influences students' competencies over time.

Research Site and Context

The research was conducted at SD Negeri 1 Labuhan Haji, an elementary school in Indonesia that has consistently implemented the Literacy and Numeracy Habituation Program (Bias Litnum). The program is conducted weekly, specifically every Tuesday before formal classroom instruction begins, integrating reading, writing, and numeracy activities into routine school practices.

The site was selected purposively due to its relevance to the research objectives, as it represents an example of how national literacy and numeracy policies are operationalized at the school level. The school context also reflects common challenges in elementary education, including variations in students' initial competencies and limited instructional resources, making it a suitable setting for examining habituation-based learning practices.

Participants and Sampling Technique

Participants in this study consisted of classroom teachers and students involved in the Bias Litnum program. The selection of participants was conducted using purposive sampling, which allows researchers to select individuals who possess relevant knowledge and experience related to the research focus.

Teachers were selected based on their direct involvement in planning and implementing literacy and numeracy activities, while students were included to capture their learning experiences and responses to the program. The inclusion of multiple participant groups enabled triangulation and provided a more comprehensive understanding of the phenomenon.

Data Collection Techniques

Data were collected using three primary techniques: classroom observation, semi-structured interviews, and documentation. The use of multiple techniques aimed to ensure data richness and enhance the credibility of findings through triangulation.

Classroom observations were conducted to examine the implementation of the Bias Litnum program in its natural setting. The researcher focused on instructional processes, student participation, interaction patterns, and classroom atmosphere. Observations were carried out repeatedly to capture routine practices and minimize the influence of incidental events.

Semi-structured interviews were conducted with teachers and selected students to obtain in-depth information about their experiences and perspectives. The flexible format allowed participants to elaborate on their responses while ensuring that key

themes related to program implementation, teacher strategies, and student engagement were addressed.

Documentation was used to support and validate findings obtained from observations and interviews. The documents analyzed included lesson plans, students' written work, numeracy worksheets, and records of classroom activities.

Research Instruments

To ensure systematic data collection, this study employed three main research instruments: observation guidelines, interview protocols, and document analysis frameworks.

The observation instrument was developed in the form of a structured guideline focusing on key aspects of classroom practice, including students' participation, teacher facilitation strategies, interaction patterns, and the overall learning atmosphere. This instrument enabled the researcher to capture consistent and comparable data across multiple observation sessions.

The interview instrument was designed as a semi-structured interview guide consisting of open-ended questions that explored three main domains: (1) the implementation of the Bias Litnum program, (2) teacher strategies in facilitating literacy and numeracy activities, and (3) students' experiences and engagement during the program. This structure allowed for flexibility while maintaining focus on the research objectives.

The document analysis instrument was developed as a framework for examining students' work and instructional materials. The analysis focused on indicators such as reading comprehension, coherence in writing, and accuracy in numeracy tasks. This instrument provided additional evidence to support findings derived from observations and interviews.

The use of these instruments ensured that data were collected in a systematic, comprehensive, and focused manner, allowing for a deeper understanding of both the processes and outcomes of the program.

Data Analysis Techniques

Data analysis followed the interactive model proposed by Miles, Huberman, and Monaro et al. (2022), consisting of data collection, data reduction, data display, and conclusion drawing.

During data reduction, relevant information was selected, coded, and categorized into themes related to program implementation, teacher strategies, student engagement, and learning outcomes. The data were then organized into thematic displays to facilitate interpretation and pattern recognition.

The analysis process was iterative, allowing the researcher to continuously refine interpretations by comparing data across sources. This approach ensured that the findings remained grounded in empirical evidence (Morgan & Nica, 2020).

Trustworthiness and Validity

To ensure the trustworthiness of the study, criteria proposed by Ahmed (2024) were applied, including credibility, transferability, dependability, and confirmability.

Credibility was achieved through data triangulation, prolonged engagement in the research setting, and cross-verification of findings from multiple sources. Transferability was supported by providing detailed descriptions of the research context and procedures. Dependability was ensured through systematic documentation of the research process, while confirmability was maintained by grounding interpretations in empirical data rather than researcher bias.

Ethical considerations were carefully addressed throughout the study. Permission to conduct the research was obtained from the school administration, and all participants were informed about the purpose of the study and their voluntary involvement.

Confidentiality was maintained by anonymizing participants' identities, and all data were used solely for research purposes. The study adhered to ethical principles of respect, beneficence, and integrity, ensuring that the research process did not disrupt learning activities or disadvantage any participants.

RESULTS AND DISCUSSION

This section presents the empirical findings of the study on the implementation of the Literacy and Numeracy Habituation Program (Bias Litnum). The results are organized into four main themes: (1) program implementation, (2) teacher facilitation strategies, (3) student engagement and behavioral changes, and (4) impacts on literacy and numeracy competencies. Each subsection combines observational data, documentation, and in-depth interview narratives to provide a comprehensive and analytically grounded understanding of the phenomenon.

Implementation of the Literacy and Numeracy Habituation Program

The findings reveal that the Bias Litnum program is implemented as a structured and routine activity embedded within the school culture. Observations indicate that the program is conducted consistently every Tuesday before formal lessons, creating a predictable and habitual learning environment for students. The activities follow a sequence of shared reading, simple writing tasks, and contextual numeracy exercises.

This implementation approach is strongly reflected in teachers' narratives. One teacher described the rationale and execution of the program in detail:

> *"In this school, we do not treat literacy and numeracy as separate or heavy lessons. Instead, we build them as habits. Every Tuesday morning, before formal learning begins, we invite students to read together, write simple responses, and work on numeracy activities that are connected to their daily life. We want students to feel that reading and counting are normal activities, not something difficult or stressful. That is why we design the program in a relaxed way."*

This statement highlights that habituation, rather than formal instruction, is the central principle of the program. The emphasis on routine and familiarity reflects a long-term approach to skill development.

Further explanation was provided by another teacher regarding the preparation of materials:

> *"Before each session, we carefully select materials that match students' abilities. We choose texts that are simple and close to their experiences, such as stories about family or school life. For numeracy, we use examples like buying things in the market or counting objects around them. We avoid giving abstract problems because students often feel confused when they cannot relate to them."*

This narrative indicates that contextualization is a deliberate instructional strategy. The use of familiar content supports comprehension and reduces cognitive barriers.

Another teacher emphasized the importance of creating a supportive atmosphere:

> *"We do not want students to feel pressured during these activities. The goal is not to test them but to help them get used to literacy and numeracy. So, we*

allow them to express their ideas freely, even if their answers are not perfect. Over time, we can see that they become more confident and willing to participate."

These findings demonstrate that the implementation of the Bias Litnum program is not merely a routine activity, but a carefully designed pedagogical approach that integrates consistency, contextualization, and emotional support. The program operates as a gradual process of internalization, where repeated exposure to meaningful activities fosters both competence and confidence. More importantly, the alignment between structured routines and flexible instructional practices indicates that habituation is not a passive repetition, but an active and intentional learning strategy that reshapes students' attitudes toward literacy and numeracy. This suggests that the effectiveness of the program lies not only in what is taught, but in how learning is continuously embedded into students' daily experiences in a way that is both accessible and sustainable.

Teacher Strategies in Facilitating Literacy and Numeracy Activities

The results indicate that teachers play a crucial role as facilitators in the Bias Litnum program. Observations show that teachers actively adapt their instructional strategies to accommodate students' diverse abilities, ensuring inclusive participation.

Teachers' narratives provide deeper insight into these strategies. One teacher explained:

"As teachers, we cannot use the same approach for all students because each child has a different level of understanding. During literacy activities, if some students still struggle, we guide them by reading together or explaining difficult words. Meanwhile, students who are more advanced are encouraged to explore the text independently. This way, all students can participate according to their abilities."

This statement highlights the application of differentiated instruction in practice. Teachers adjust their support to meet individual learning needs.

Another teacher elaborated on the importance of balancing guidance and independence:

"We try to help students when they find difficulties, but we do not give answers directly. Instead, we guide them step by step and encourage them to think on their own. For example, in numeracy activities, we ask them how they get the answer, not just whether the answer is correct."

This indicates that the focus is on developing reasoning rather than rote learning.

Additionally, the use of learning media was emphasized:

"We often use pictures, real objects, and simple examples to make learning more interesting. For students who still have difficulty reading, pictures help them understand the story faster. In numeracy, using real-life situations makes it easier for students to understand numbers."

These results support the thesis that teacher facilitation in the Bias Litnum program is defined by dynamic and responsive approach to teaching. Educators do not simply present material but they engage in building learning experiences, which are unique to the students and their environments. The combination of differentiation and guided inquiry with contextual learning is an indicator of a pedagogical orientation that emphasizes understanding as opposed to memorization. Also, the fact that the teachers could strike the right balance between support and autonomy bears testimony to a sensitive understanding of the way in which learning comes with

gradual evolution. This implies that the outcome of the program greatly depends on the ability of teachers to make ordinary activities interesting learning experiences that are inclusive, engaging and cognitively challenging.

Student Engagement and Behavioral Changes

The implementation of the Bias Litnum program has resulted in noticeable improvements in student engagement and classroom behavior. Observations indicate that students participate more actively during literacy and numeracy activities compared to regular lessons.

This change is reflected in teachers' observations. One teacher stated:

> *"At the beginning, some students were very quiet and hesitant to participate. They were afraid of making mistakes, especially when reading aloud. However, after several weeks of implementing this program, we noticed that they became more confident. They started to volunteer, ask questions, and even help their friends."*

This shows a gradual shift in students' confidence and participation.

Another teacher added:

> *"Students now look forward to the literacy and numeracy sessions. They often ask what activities we will do on Tuesday. This is different from regular lessons, where they sometimes feel bored. The relaxed atmosphere makes them more enthusiastic."*

This indicates that the program successfully creates a positive learning environment.

Students' perspectives further support these findings. One student explained:

> *"I like the activity because we can read together and talk about the story. It feels more fun than usual lessons. I am not afraid to speak because the teacher does not get angry if I make mistakes."*

Such results prove that the Bias Litnum program has a significant effect not only on the academic interest of students but on their emotional and social behavior as well. The fact that passive participation is being converted to active participation, demonstrates the value of establishing a low pressure and supportive learning environment. The program seems to alleviate fear, anxiety and help students make risks, and become more involved in the learning process. Further, the development of collaborative behaviours and peer support indicates that learning is not solely an individual but also a social process. This implies that the holistic learning environment where cognitive growth comes with enhanced confidence, motivation and interpersonal interaction can be achieved through habituation-based programs.

Impact on Students' Literacy Competencies

The findings indicate that the Bias Litnum program contributes to the improvement of students' literacy competencies, particularly in reading comprehension and writing skills. Documentation of students' work shows gradual improvement in coherence, sentence structure, and relevance.

Teachers provided detailed insights into this development. One teacher stated:

> *"We can see that students now understand the stories better. Before, they could only read without really understanding the content. Now, they are able to explain the main idea and even relate it to their own experiences."*

This indicates improvement in comprehension and interpretation.

Another teacher explained:

> *"Their writing has also improved. At first, many students wrote incomplete sentences, but now they can write simple but clear sentences. Even though it is still basic, we can see progress in how they express their ideas."*

This reflects development in written expression.

Furthermore, a teacher added:

> *"Students who used to be afraid of writing are now more confident. They are willing to try, and they do not depend too much on the teacher anymore."*

This information may indicate that the Bias Litnum program not only promotes the development of literacy on the level of technical skills but also the level of understanding and expression. By combining the reading, discussion, and writing tasks, students become able to work with texts more productively and express their thoughts more clearly. The observed gradual improvement implies that the development of literacy is a cumulative process that can be advanced through a regular practice and positive instructions. Notably, the program also instills positive attitude towards literacy that are fundamental in supporting long-term learning.

Impact on Students' Numeracy Competencies

The program also demonstrates a positive impact on students' numeracy competencies. Documentation of worksheets shows increased accuracy and consistency in basic arithmetic tasks.

Teachers described these improvements in detail. One teacher stated:

> *"Students are now more confident when working with numbers. They are not as afraid of mathematics as before. They try to solve problems and are willing to explain how they get the answer."*

This reflects improved confidence and reasoning.

Another teacher explained:

> *"When we use real-life examples, students understand better. For example, when we talk about buying and selling, they can imagine the situation and solve the problem more easily."*

This highlights the effectiveness of contextual learning.

Additionally, a teacher noted:

> *"Students are more persistent now. Even if they find a problem difficult, they try to solve it instead of giving up immediately."*

These findings demonstrate that the Bias Litnum program enhances students' numeracy competencies in a comprehensive manner, encompassing both procedural accuracy and conceptual understanding. The use of contextual tasks enables students to connect abstract mathematical concepts with real-life situations, thereby making learning more meaningful and accessible. Furthermore, the increase in persistence and confidence indicates that the program also influences students' attitudes toward mathematics. This suggests that habituation-based approaches can play a significant role in developing not only skills but also positive learning dispositions in numeracy.

Table 1. Summary of Research Findings on Bias Litnum Implementation

Aspect	Key Findings
Program Implementation	Routine, structured, contextual, non-formal
Teacher Strategies	Differentiation, scaffolding, contextual learning
Student Engagement	Increased confidence, participation, collaboration

Literacy Competence	Improved comprehension and writing ability
Numeracy Competence	Improved reasoning, accuracy, persistence

Source: Primary data analysis, 2026

Table 1 summarizes the main findings, showing that the effectiveness of the Bias Litnum program is supported by the interaction between structured implementation, adaptive teaching strategies, and positive student engagement.

Figure 1. Stages of Literacy and Numeracy Habituation Activities (Bias Litnum)

Source: Primary data analysis, 2026

Figure 1 sequential stages of the Bias Litnum program, consisting of shared reading, guided writing, and contextual numeracy activities. The figure shows how these stages are interconnected and implemented as a continuous routine. This sequence reflects a structured habituation process in which students gradually develop literacy and numeracy competencies through repeated, contextual, and student-centered activities.

Discussion

Habituation-Based Integrated Literacy and Numeracy Learning: The Role of Teacher Facilitation and Student Engagement

This study provides empirical evidence that the implementation of the Literacy and Numeracy Habituation Program (Bias Litnum) contributes significantly to the development of students' foundational competencies through a combination of routine practice, contextual learning, adaptive teacher facilitation, and increased student engagement. Rather than functioning as isolated instructional activities, literacy and numeracy practices are embedded within a habituation framework that emphasizes repetition, relevance, and a supportive learning environment. This integrated approach offers a more comprehensive understanding of how foundational competencies can be strengthened in elementary education.

The results affirm that the habituation is core in supporting the development of literacy and numeracy. In line with the existing literature, active participation in literacy practices has proven to improve reading comprehension and logical reasoning (Tamaulina, 2025; Siregar and Siregar, 2025). In the same vein, Selman and Dilworth-Bart (2024) claim that structured routines promote cognitive and behavioral development, as it provides predictable learning environments. The current research builds on this view by showing that habituation is not repetitive

practice but it is an organized process of pedagogy which incorporates cognitive, contextual and affective aspects of learning. The Bias Litnum program shows that when students are repeatedly exposed to meaningful tasks that students are able to internalize literacy and numeracy as part of their daily lives instead of as an academic requirement.

Compared to more conventional teaching methods that focus on the formal evaluation and the result of performance, the results show that non-formal and low-pressure atmosphere of the program is a vital factor in promoting learning. This is in tandem with Đorić and Kuruzovic (2025) which points out that anxiety regarding performance can be reduced to enhance student participation and engagement. Moreover, Bizimana (2025) highlight the critical role of supportive learning conditions in enhancing motivation and the desire to continue learning in early education. These findings are supported by the current study, which demonstrates that, when students feel free to commit mistakes and share their ideas, they become more engaged in the learning process. This implies that emotional aspects play a crucial role in determining the success of the habituation-based learning, and this aspect has not been extensively explored in the literature.

The other major contribution of this research is the aspect of teacher facilitation. The results show that teachers are dynamic facilitators, and they constantly change their teaching methods depending on the needs of students. This aligns with Qorib (2024) who underlines the significance of differentiated instruction in meeting the needs of various learning abilities. On the same note, Munaji et al. (2025) emphasize that flexibility and creativity of teachers are necessary in enhancing the literacy and numeracy skills. Nevertheless, this research provides a subtle insight, showing that a good facilitator does not rely on the implementation of a specific set of strategies; they must also be responsive to the classroom processes. The teachers in the Bias Litnum program use scaffolding, contextual explanation and guided inquiry to aid student learning as an expression of a dynamic and situational approach to instruction.

This observation also correlates with Sujatha and Vinayakan (2023) Rahmah and Zulfadewina (2025), which promotes the use of literacy and numeracy teaching that is more focused on reasoning, understanding, and practical use. Contextual tasks in numeracy activities like real life problem solving situations allow students to be able to build conceptual knowledge as opposed to merely processing procedural knowledge. Likewise, discussion and interpretation literacy activities promote more in-depth interactions with texts. Combining these strategies implies that learning can be effectively achieved when students are actively engaged in the process of meaning construction, as opposed to passively receiving information.

Student engagement emerges as a critical mediating factor in the relationship between program implementation and learning outcomes. Previous studies have identified engagement as a key predictor of academic achievement (Roche et al., 2023; Li et al., 2022). The present study confirms this relationship by showing that increased participation, confidence, and collaboration are associated with improvements in literacy and numeracy competencies. However, it further extends existing literature by conceptualizing engagement as a dynamic process that develops through repeated exposure to positive learning experiences. The findings suggest that engagement is not only an outcome of effective instruction but also a mechanism that facilitates learning, highlighting its dual role in educational processes.

A distinctive contribution of this study is its integrated approach to literacy and numeracy development. While previous research often examines these competencies separately, the findings demonstrate that they can be effectively developed within a

unified framework. This supports the argument by Sujatha and Vinayakan (2023) that integrating mathematical and real-world applications enhances learning relevance. Additionally, Díez-Palomar et al. (2023) emphasize the importance of making numeracy visible in everyday contexts. The Bias Litnum program operationalizes this integration by embedding both literacy and numeracy activities within meaningful and contextualized learning experiences, thereby promoting cognitive transfer and holistic development.

From a theoretical perspective, this study contributes to the literature by proposing a model of habituation-based learning that integrates three key dimensions: (1) routine and consistency, (2) contextual and meaningful learning, and (3) adaptive facilitation supported by student engagement. This model extends existing frameworks by highlighting the interaction between these elements as a critical factor in developing foundational competencies. It suggests that effective literacy and numeracy programs should not focus solely on instructional content but also on the processes and environments that shape learning experiences.

From a practical standpoint, the findings have important implications for educational policy and practice. First, they suggest that habituation-based programs can be a viable strategy for improving literacy and numeracy outcomes, particularly in contexts where students face challenges in mastering basic competencies. Schools should consider integrating routine literacy and numeracy activities into daily or weekly schedules to promote sustained engagement. Second, the role of teachers as adaptive facilitators underscores the need for professional development programs that emphasize flexibility, creativity, and responsiveness in teaching. Third, the importance of contextual learning highlights the need for instructional materials that are relevant to students' experiences and environments.

Despite these contributions, the study has several limitations. The research was conducted in a single school, which may limit the generalizability of the findings to other contexts. Additionally, the qualitative design provides in-depth insights but does not allow for the measurement of causal relationships between variables. Future research could address these limitations by employing mixed-method approaches and conducting comparative studies across multiple schools or regions. Longitudinal studies are also needed to examine the long-term impact of habituation-based programs on students' academic development.

Future research directions should also explore the integration of digital technologies in literacy and numeracy habituation programs, particularly in the context of increasing digitalization in education. Investigating how technology can support or enhance habituation processes may provide valuable insights for improving program effectiveness. Furthermore, research on teacher professional development models that support adaptive facilitation could contribute to the sustainability of such programs.

CONCLUSION

This study demonstrates that the Literacy and Numeracy Habituation Program (Bias Litnum) contributes significantly to the development of students' foundational competencies through a structured yet flexible learning approach. The findings indicate that the integration of routine practice, contextual learning, and adaptive teacher facilitation enhances students' reading comprehension, writing coherence, and numeracy reasoning. In addition, the program fosters positive learning behaviors, including increased confidence, participation, and collaboration among students.

From a theoretical perspective, this study extends the concept of habituation-based learning by highlighting its multidimensional nature, encompassing cognitive,

affective, and contextual elements. It also emphasizes the role of student engagement as a mediating factor in strengthening learning outcomes. Practically, the findings suggest that schools can adopt habituation-based programs as a sustainable strategy to improve literacy and numeracy, particularly when supported by adaptive teaching practices and relevant learning materials. However, this study is limited by its focus on a single research site and its qualitative design, which may restrict generalizability. Future research is recommended to employ mixed-method approaches, involve multiple school contexts, and examine the long-term impact of habituation-based programs. Further studies may also explore the integration of digital tools to enhance literacy and numeracy learning.

REFERENCES

Ahmed, S. K. (2024). The pillars of trustworthiness in qualitative research. *Journal of medicine, surgery, and public health*, *2*, 100051. https://doi.org/10.1016/j.glmedi.2024.100051

Aini, K., AR, M. M., & Ridwan, M. (2024). Growing Numeral Literacy Skills through Science, Technology, Engineering, Arts, Mathematics Based on Local Wisdom. *Mimbar PGSD Undiksha*, *12*(1), 64-72. https://doi.org/10.23887/jjpgsd.v12i1.67642

Ajani, O. A. (2024). Enhancing pre-service teacher education: Crafting a technology-responsive curriculum for modern classrooms and adaptive learners. *Research in Educational Policy and Management*, *6*(2), 209-229. https://doi.org/10.46303/repam.2024.32

Andriani, D. N., Wibawa, R. P., Firtriawati, D., Winanda, I., & Saputri, M. A. (2025). Project-Based Learning Based on Mastery Learning to Improve Continuous Numeracy Literacy in High School Students: Literature Review. *EDUKASIA Jurnal Pendidikan Dan Pembelajaran*, *6*(1), 595-610. https://doi.org/10.62775/edukasia.v6i1.1462

Asrifan, A., Widyaningrum, A., Ramli, R. B., Riyanti, R., & Sultan, S. (2025). Navigating the AI Era: Enhancing Critical Thinking Skills for Global Challenges. In *Enhancing Classroom Instruction and Student Skills With AI* (pp. 449-480). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3373-4576-5.ch013

Aziz, M., & Rawian, R. (2022, September). Modeling higher order thinking skills and metacognitive awareness in English reading comprehension among university learners. In *Frontiers in education* (Vol. 7, p. 991015). Frontiers Media SA. https://doi.org/10.3389/feduc.2022.991015

Betthäuser, B. A., Bach-Mortensen, A. M., & Engzell, P. (2023). A systematic review and meta-analysis of the evidence on learning during the COVID-19 pandemic. *Nature human behaviour*, *7*(3), 375-385. https://doi.org/10.1038/s41562-022-01506-4

Bizimana, E. (2025). Exploring the Contribution of Perceived Supportive Classroom Learning Environment to Students' Engagement in Learning. *European Journal of Psychology and Educational Research*, *8*(2), 97-112. https://doi.org/10.12973/ejper.8.2.97

Cash, R. M. (2017). *Advancing differentiation: Thinking and learning for the 21st century*. Free Spirit Publishing.

Chang, I. (2023). Early numeracy and literacy skills and their influences on fourth-grade mathematics achievement: a moderated mediation model. *Large-scale Assessments in Education*, *11*(1), 18. https://doi.org/10.1186/s40536-023-

00168-6

Díez-Palomar, J., Ramis-Salas, M., Močnik, I., Simonič, M., & Hoogland, K. (2023, November). Challenges for numeracy awareness in the 21st century: making visible the invisible. In *Frontiers in education* (Vol. 8, p. 1295781). Frontiers Media SA. https://doi.org/10.3389/feduc.2023.1295781

Đorić, V., & Kuruzović, N. (2025). Addressing foreign language anxiety in EFL classrooms: interventions to enhance the student performance and engagement. In *Tematski zbornik Jezik i društvene nauke u kontaktu: izazovi interdisciplinarnosti/Međunarodna konferencija* (pp. 238-249). Novi Sad: Univerzitet u Novom Sadu, Filozofski fakultet. http://dx.doi.org/10.5281/zenodo.14976777

Fitria, N., & Kurniawan, H. (2022). Peran guru dalam penguatan literasi dan numerasi di sekolah dasar. *Jurnal Pendidikan Dasar Nusantara, 7*(1), 45–55. https://doi.org/10.31004/jrpp.v8i4.54393

Fletcher, J. M., & Vaughn, S. (2009). Response to intervention: Preventing and remediating academic difficulties. *Child development perspectives*, *3*(1), 30-37. https://psycnet.apa.org/doi/10.1111/j.1750-8606.2008.00072.x

Geetha, V. (2025). Teaching-Learning Pedagogy: Contemporary Approaches. *Multidisciplinary Research Area in Arts, Science & Commerce (Volume-9)*, 6.

Halabieh, H., Hawkins, S., Bernstein, A. E., Lewkowict, S., Unaldi Kamel, B., Fleming, L., & Levitin, D. (2022). The future of higher education: Identifying current educational problems and proposed solutions. *Education Sciences*, *12*(12), 888. https://doi.org/10.3390/educsci12120888

Kihwele, J. E., & Mkomwa, J. (2023). Promoting students' interest and achievement in mathematics through "King and Queen of Mathematics" initiative. *Journal of Research in Innovative Teaching & Learning*, *16*(1), 115-133. https://doi.org/10.1108/JRIT-12-2021-0083

Kurniaman, O., Islami, N., Putra, Z. H., & Al Fajar, B. (2025). Trends in learning and assessment used in elementary schools in Indonesia; Opportunities and challenges. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, *14*(3), 374-388. https://doi.org/10.33578/jpfkip.v14i3.p374-388

Lechner, C. M. (2023). Patterns and predictors of literacy and numeracy development during adulthood: Insights from two longitudinal assessment surveys. In *Education, Competence Development and Career Trajectories: Analysing Data of the National Educational Panel Study (NEPS)* (pp. 87-112). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-27007-9_4

Li, L., Valiente, C., Eisenberg, N., Spinrad, T. L., Johns, S. K., Berger, R. H., ... & Gal-Szabo, D. E. (2022). Longitudinal relations between behavioral engagement and academic achievement: The moderating roles of socio-economic status and early achievement. *Journal of school psychology*, *94*, 15-27. https://doi.org/10.1016/j.jsp.2022.08.001

Marks, R. A., Woods, A. D., Mesite, L., Fox, A. B., & Christodoulou, J. A. (2022). Early reading and math developmental trajectories: Examining influences of specific learning disabilities and socioeconomic status. *Journal of Learning Disabilities*, 00222194251391828. https://doi.org/10.1177/00222194251391828

Monaro, S., Gullick, J., & West, S. (2022). Qualitative data analysis for health

research: A step-by-step example of phenomenological interpretation. *Qualitative Report*, *27*(4), 1040-1057. https://doi.org/10.46743/2160-3715/2022.5249

Morgan, D. L., & Nica, A. (2020). Iterative thematic inquiry: A new method for analyzing qualitative data. *International journal of qualitative methods*, *19*, 1609406920955118. https://doi.org/10.1177/1609406920955118

Munaji, M., Rohaeti, T., Mutadi, M., Sumliyah, S., & Kodirun, K. (2025). A literature review of flexibility in interactive mathematics classrooms: the role of teachers and students. *Journal of Education and Learning (EduLearn)*, *19*(2), 597-605. https://doi.org/10.11591/edulearn.v19i2.21501

Niklas, F., Cohrssen, C., & Tayler, C. (2016). Parents supporting learning: A non-intensive intervention supporting literacy and numeracy in the home learning environment. *International Journal of Early Years Education*, *24*(2), 121-142. https://psycnet.apa.org/doi/10.1080/09669760.2016.1155147

Panda, S., & Kaur, N. (2024). Empowered minds: Navigating digital seas with emerging information literacy framework. In *Examining information literacy in academic libraries* (pp. 48-82). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-1143-1.ch004

Prabowo, A., Suparman, S., Li, C. S., Janan, D., & Damayanti, T. D. (2023). The effect of reading literacy to mathematics comprehension of elementary school students in Indonesia and Malaysia. *Int J Eval & Res Educ ISSN*, *2252*(8822), 8822. http://doi.org/10.11591/ijere.v12i1.25714

Qorib, M. (2024). Analysis of differentiated instruction as a learning solution in student diversity in inclusive and moderate education. *International Journal Reglement & Society (IJRS)*, *5*(1), 43-55. https://doi.org/10.55357/ijrs.v5i1.452

Quibrantar, S. M., & Ezezika, O. (2023). Evaluating student engagement and experiential learning in global classrooms: A qualitative case study. *Studies in Educational Evaluation*, *78*, 101290. https://doi.org/10.1016/j.stueduc.2023.101290

Rahayu, W. N., & Firdaus, F. M. (2025). Increased Motivation and Ability Student Numeracy Through the Application of a Contextual Approach to Mathematics Learning. *Jurnal Prima Edukasia*, *13*(2), 361-374. https://doi.org/10.21831/jpe.v13i2.75555

Rahmah, M., & Zulfadewina, Z. (2025). Analysis of fifth-grade students' numeracy literacy skills in Mathematics. *Curricula: Journal of Curriculum Development*, *4*(2b), 1811-1822. https://doi.org/10.17509/curricula.v4i2.90123

Ramos-Vallecillo, N., Murillo-Ligorred, V., & Lozano-Blasco, R. (2024). University students' achievement of meaningful learning through participation in thinking routines. *European Journal of Investigation in Health, Psychology and Education*, *14*(4), 1012-1027. https://doi.org/10.3390/ejihpe14040066

Roche, A., Gervasoni, A., & Kalogeropoulos, P. (2023). Factors that promote interest and engagement in learning mathematics for low-achieving primary students across three learning settings. *Mathematics Education Research Journal*, *35*(3), 525-556. https://doi.org/10.1007/s13394-021-00402-w

Selman, S. B., & Dilworth-Bart, J. E. (2024). Routines and child development: A systematic review. *Journal of Family Theory & Review*, *16*(2), 272-328. https://doi.org/10.1111/jftr.12549

Sinaga, T., Kadaryanto, B., & Aulia, N. (2023). Indonesian high school students' critical thinking and literary text comprehension. *ELE Reviews: English Language Education Reviews*, *3*(2), 155-171. https://doi.org/10.22515/elereviews.v3i2.7621

Siregar, N., & Siregar, R. S. (2025). Analysis of numeracy literacy of junior high school students in AKM questions: Learning strategies based on higher order thinking skills at SMP Negeri 5 Tapung Hilir. *Jurnal Profesi Guru Indonesia*, *2*(1), 359-367. https://doi.org/10.62945/jpgi.v2i1.720

Sthapak, S., & Sawlani, R. (2024). Inclusive and equitable literacy and numeracy practices at foundational stage: global and comparative perspective. *ShodhKosh Journal of Visual and Performing Arts*, *5*(7). https://doi.org/10.29121/shodhkosh.v5.i7.2024.2873

Sujatha, S., & Vinayakan, K. (2023). Integrating math and real-world applications: A review of practical approaches to teaching. *International Journal of Computational Research and Development*, *8*(2), 55-60.

Sujatha, S., & Vinayakan, K. (2023). Integrating math and real-world applications: A review of practical approaches to teaching. *International Journal of Computational Research and Development*, *8*(2), 55-60.

Sujatha, S., & Vinayakan, K. (2023). Integrating math and real-world applications: A review of practical approaches to teaching. *International Journal of Computational Research and Development*, *8*(2), 55-60.

Tamaulina, T. (2025). Developing Critical and Logical Thinking Skills Through the Use of Non-Routine Problems in Mathematics Education. *The Journal of Academic Science*, *2*(9), 2172-2179. https://doi.org/10.59613/hhvase06

Terrell, P., & Watson, M. (2018). Laying a firm foundation: Embedding evidence-based emergent literacy practices into early intervention and preschool environments. *Language, speech, and hearing services in schools*, *49*(2), 148-164. https://doi.org/10.1044/2017_lshss-17-0053

Tomlinson, C. A. (2017). *How to differentiate instruction in academically diverse classrooms*. Ascd.

Tuong, H. A., Nam, P. S., Hau, N. H., Tien, V. T. B., Lavicza, Z., & Hougton, T. (2023). Utilizing STEM-based practices to enhance mathematics teaching in Vietnam: Developing students' real-world problem solving and 21st century skills. *JOTSE: Journal of Technology and Science Education*, *13*(1), 73-91. https://doi.org/10.3926/jotse.1790

Vito, H. (2025). Evaluation of the Implementation of the Independent Learning Curriculum in Improving Literacy and Numeracy Competence. *Didaskalos Journal*, *1*(1), 01-09. https://doi.org/10.23887/jppp.v7i3.66635

Wulandari, F. D. (2026). Critical literacy in the digital age: discourse analysis of online learning materials in Indonesian higher education. *Indonesian Journal of Language and Educational Studies*, *1*(1), 14-26.