Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 10 Nomor 1 January 2026 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v10i1.515

Qualitative Analysis of the Literacy and Numeracy Habituation Program on the Critical Thinking Skills of Grade III Students at SDN Pendem 01

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ABSTRACT

Elementary education plays a vital role in developing students' critical thinking skills, particularly through literacy and numeracy habits. This study aims to analyze the contribution of literacy and numeracy habits on the thinking skills of third-grade students at SDN Pendem 01. This study used a descriptive qualitative approach, with data collection techniques including interviews, observation, and documentation. Data were analyzed using source triangulation methods and techniques to achieve valid and comprehensive results. The results of the study indicate that literacy habits such as storytelling and chain Reading, and numeracy habits such as counting, quizzes, and puzzles, play an essential role in improving students' critical thinking skills in the areas of interpretation, analysis, evaluation, and inference. Interviews with the principal, teachers, and students indicate that these habits not only improve numeracy skills but also foster self-confidence, independence, and reflective skills. Overall, literacy and numeracy habits at SDN Pendem 01 are proven effective in developing students' critical thinking skills through fun contextual activities and a focus on meaningful learning. These findings suggest that the literacy and numeracy habituation program significantly contributes to the development of students' critical thinking skills through contextual, interactive, and meaningful learning.

Keywords*: *critical thinking, elementary school, literacy, numeracy

Submitted	Accepted	Published
04 December 2025	08 January 2026	30 January 2026

Citation	:	Kamila, K., & Mukhlishina, I. (2026). Qualitative Analysis of the Literacy and Numeracy Habituation Program on the Critical Thinking Skills of Grade III Students at SDN Pendem 01. *Jurnal PAJAR (Pendidikan dan Pengajaran), 10*(1), 26-34. DOI: http://dx.doi.org/10.33578/pjr.v10i1.515.

INTRODUCTION

Elementary education is a crucial foundation for developing students' abilities, particularly in preparing them to face future challenges (Halim, 2022). Elementary school students are not only required to master basic knowledge such as reading, writing, and arithmetic, but are also guided to develop more critical, logical, and systematic thinking. Critical thinking skills are essential from an early age, as they can assist students in decision-making, problem-solving, and developing a deeper understanding of information (Herlina, 2025). This aligns with the thinking of Waiswa et al. (2024), who assert that a good understanding of literacy is crucial to understanding numeracy, as both involve higher-level cognitive processes such as comprehension, reasoning, and problem-solving. These findings show that students need to master literacy and numeracy as two basic skills from an early age. Literacy refers to the ability to read and write, but it extends beyond recognizing letters and numbers to understanding and interpreting information effectively. Literacy enables students to deeply grasp meaning, connect new information to their past experiences, and develop critical thinking skills. (Epik et al., 2025).

Numeracy is related to the basic ability to understand and apply numbers and mathematical concepts in everyday activities. (Witono & Hadi, 2025). Numeracy is not only about counting, but also the ability to measure, estimate, compare, and solve contextual problems involving numbers. (Yaqin, 2024). Through numeracy training, students become accustomed to reasoning carefully and in a structured manner to solve the problems they face. By practicing these two skills intensively, students' critical thinking can be enhanced, as they both train interpretation, analysis, evaluation, and inference. This is because both literacy and numeracy require the skills of analyzing, synthesizing, and evaluating the information obtained. This process

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allows students not only to receive information passively but also to process it, question it, and draw conclusions, thereby fostering critical thinking that is useful both in everyday life and in the learning process. SDN Pendem 01 implements literacy and numeracy programs to improve students' critical thinking skills. The program encompasses not only reading and arithmetic but also observation and understanding. These literacy and numeracy programs consist of several activities, such as *storytelling*, reading chains, crooked puzzles, and quizzes. The activities carried out are linked to students' daily lives to facilitate their understanding.

Based on interviews conducted on September 17, 2025, with Grade III teachers, it was found that literacy and numeracy habituation was motivated by students' lack of literacy and numeracy skills, so many of them were unable to understand the learning. Before this habituation, most students were slow to understand information, lacked self-confidence, and were hesitant to express their opinions and feelings. As time goes by, literacy and numeracy skills are increasingly critical to develop, as technology advances, making them essential for elementary school students.

Based on observations conducted by researchers on September 17, 2025, SDN Pendem 01 has several interesting programs. One of these interesting programs is the Literacy and Numeracy Program, which is very important for elementary school students. This program not only functions as a routine activity but also serves as a strategic effort to instill reading, writing, and numeracy habits from an early age. Implementing this program is very important for elementary school-aged children because it can lay the foundation for academic skills while supporting the development of critical, logical, and creative thinking in the early stages of education.

Previous research (Iasha et al., 2024) shows that literacy and numeracy are important foundations for developing students' critical thinking skills. Furthermore, developing literacy and numeracy habits can help students become more independent and confident. Therefore, efforts are needed to improve literacy and numeracy habits in Elementary Schools, both through learning and providing supporting infrastructure for literacy and numeracy activities. The similarity of this study emphasizes that literacy and numeracy are the foundation of Elementary School education, helping develop critical thinking skills, independence, and self-confidence. However, there is a significant difference: this study focuses more on the Literacy and Numeracy Habituation Program at SDN Pendem 01. The novelty of this study lies in the Literacy and Numeracy Habituation Program, which is more interactive and relevant to students' daily lives, making it more practical for improving literacy and numeracy in Indonesia.

This study was conducted to analyze the relationships among literacy and numeracy habits, and the critical thinking skills of third-grade students at SDN Pendem 01. To date, research on the impact of literacy and numeracy habits on students' critical thinking skills has been limited, so this study is expected to provide new insights into strengthening critical thinking skills through these habits in elementary schools.

LITERATURE REVIEW

Literacy and numeracy skills are important foundations in basic education and significantly influence students' development of critical thinking skills. Literacy is not just Reading and writing, but also a cognitive process that involves interpretation, analysis, evaluation, and inference to obtain meaningful information (Setiawan, 2023). Through literacy activities, students develop the skills to understand texts, identify main ideas, and draw conclusions using logical reasoning. Similarly, numeracy goes beyond basic arithmetic; it includes the ability to apply numerical concepts, analyze quantitative data, and solve contextual problems encountered in everyday life (Kurniawan et al., 2025). Numeracy is not limited to mastery of basic arithmetic but also includes the ability to understand number concepts, analyze, reason, and explain mathematical problems, and to solve and understand them in various everyday-life situations (Situmorang et al., 2025). These two skills are interrelated, as strong literacy skills help students understand the context of problems, while numeracy skills require logical reasoning that reinforces critical thinking. This habit directly encourages the

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development of critical thinking skills because students not only passively receive information but also actively process and evaluate it (Sastradinata, 2023).

Previous studies have shown that low literacy and numeracy skills among elementary school students negatively affect their critical thinking abilities. (Izzayanti, 2024) revealed that students with poor literacy and numeracy habits tend to have difficulty analyzing information, expressing opinions, and making rational decisions. This aligns with the research by Afriantoni et al. (2025), which found that a lack of continuous literacy and numeracy practice leads to passive learning among students, who rely more on memorization than on analytical thinking. Several other studies also confirm that limitations in literacy and numeracy hinder the development of higher-order thinking skills, because learning tends to be teacher-centered and requires students to memorize without truly understanding the problems in the questions (Jannah & Hayati, 2024). This highlights the importance of structured, consistent habit-forming programs for improving students' thinking quality.

Previous research is generally divided into two trends: one focused on mastery of technical literacy and numeracy, and the other on learning strategies to develop critical thinking. However, studies that integrate literacy and numeracy into a structured, contextual program through qualitative research remain limited. This encourages researchers to examine more deeply the role of literacy and numeracy in shaping students' critical thinking skills. Conceptually, literacy supports understanding and evaluation of information, while numeracy supports logical and quantitative reasoning; both require complementary processes of interpretation, analysis, evaluation, and inference. Therefore, this study aims to fill this gap by analyzing the habituation of literacy and numeracy within an integrated program at SDN Pendem 01, providing empirical and conceptual contributions to the development of critical thinking skills among elementary school students.

METHOD

The research method used is a descriptive qualitative approach. This qualitative descriptive method aims to depict and describe existing events, whether natural or artificial, using a simple, inductive approach. This qualitative research approach emphasizes the analysis of inductive and deductive reasoning processes and the relationships between observed phenomena using logic (Rois & Astina, 2018).

The data collection techniques used in this study included interviews, observations, and documentation. The interview method used was an in-depth interview with the primary sources, namely the Principal, Grade III Teachers, and students, who provided important and relevant information in the study. This observation method was used to understand the implementation of literacy and numeracy habits at SDN Pendem 01, including observing storytelling activities, chain reading, concocting, puzzles, and quizzes, as well as documentation methods to strengthen the collected data.

To obtain accurate research data, researchers conduct data verification, commonly known as triangulation. Researchers use source triangulation, which involves verifying information obtained from multiple sources. Technical triangulation involves verifying data from the same source using different methods. Time triangulation involves verifying data from the same source using the same technique at different times or under different conditions (Mekarisce, 2020). The four indicators of critical thinking in this study are:

Table 1. Normaya (Deta et al., 2023)

General Indicators of Critical Thinking	Sub Indicators
Interpretation	Understand the problems shown in writing or asked questions correctly.
Analysis	Identifying the relationships between statements, questions, and concepts given in the problem by creating an appropriate mathematical model and providing an appropriate explanation.

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Evaluation	Using the right strategy in solving problems, complete and correct calculations.
Inference	Make conclusions correctly.

Normaya's research, critical thinking indicators are based on four aspects used by Facione: Interpretation, analysis, evaluation, and inference. These four indicators are used as a reference for analyzing data from observations and interviews, particularly in examining literacy and numeracy habituation activities that contribute to students' development of interpretation, analysis, evaluation, and inference.

RESULTS AND DISCUSSION

Literacy Habits for Critical Thinking Skills

Literacy activities at SDN Pendem 01 are carried out regularly through two main activities: *storytelling* and chain reading. Both activities aim to increase students' interest in reading, deepen their understanding of text meaning, and stimulate critical thinking skills, including interpretation, analysis, evaluation, and inference.

Storytelling

The research results show that storytelling is compelling in helping students understand the story's content, both verbally and visually. In terms of interpretation, students can identify problems, characters, and simple solutions within the narrative. This occurs because storytelling presents the text in a vivid narrative form, which makes it easier for students to construct meaning. In accordance with constructivist theory, students do not simply receive information; instead, they develop understanding through interaction with the story and the teacher's questions.

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Figure 1. Storytelling Activity

In the analysis aspect, students begin to recognize story structure (orientation, complication, resolution) and the cause-and-effect relationships between events. This demonstrates that storytelling serves as an initial tool for practicing systematic thinking. However, analyzing implied meaning still requires guidance, which is understandable given that third-grade students' cognitive development is still in the concrete operational phase.

In the evaluation aspect, students assessed the character's behavior in terms of moral values, such as honesty, mutual assistance, and responsibility. These findings indicate that storytelling not only improves literacy but also encourages reflective thinking and character development. This activity was effective because

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it connected the story's values to students' real-life experiences, making the evaluation process relevant to their daily lives. Meanwhile, in the inference aspect, some students drew simple conclusions about the moral message, although many still needed guidance. This indicates that the ability to conclude is developing but needs further strengthening through regular reflection and directed discussions.

Overall, storytelling functions as a contextual medium that encourages students to understand, analyze, evaluate, and draw conclusions. This aligns with research (Rizka et al., 2025) that shows that the use of contextual and innovative learning media in the learning process can encourage the development of students' critical thinking skills.

Chain Reading

Chain Reading activities (reading texts alternately between students) help students become actively involved in understanding the text's structure. In the interpretation aspect, students become more focused on the storyline, characters, and sequence of events, as each child is responsible for a specific section of the text. This activity strengthens literal comprehension and hones concentration. In the analysis aspect, students begin to connect events, recognize conflicts, and understand character roles, mainly when supported by visual media such as concept maps. This shows that chain reading encourages students to think coherently and logically.

Figure 2. Chain reading activity

In the evaluation aspect, students assessed the character's behavior based on simple moral values, although they had not yet reached the stage of evaluating the text's style or structure. This indicates that students' evaluative skills developed at the content level rather than the technical linguistic level. Meanwhile, in the inference aspect, students were able to draw conclusions about the moral message and relate it to their daily lives. Class discussions played a crucial role in helping students gradually reach conclusions.

Analytically, the chained reading method is effective because it combines reading, listening, and discussion activities, thus enhancing information processing. This finding supports the finding of HT et al. (2024) that literacy habits using appropriate methods or models can foster students' critical thinking skills.

Numeracy Habits for Critical Thinking Skills

Numeracy education at SDN Pendem 01 is delivered through structured, engaging activities such as counting, puzzles, and quizzes. In these activities, students not only learn to perform calculations but are also

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encouraged to understand concepts, analyze patterns, and develop problem-solving strategies. The goal of these activities is to develop students' critical thinking and mathematical skills from an early age, so they can solve simple math problems with logic, precision, and depth of understanding, rather than memorize formulas. In addition, these numeracy activities also help increase students' self-confidence and persistence in facing academic challenges in a fun way.

Mencongak

Mencongak activities significantly improve students' speed and accuracy in logical thinking. In interpretation, students can quickly identify numerical problems and relationships among numbers. Mencongak students to understand numerical situations without relying on lengthy procedures. In analysis, students begin to compare quick strategies with longer ones, choosing methods based on the problem's difficulty. This demonstrates the development of analytical thinking skills and cognitive efficiency.

In the evaluation aspect, students can assess the strengths and weaknesses of the strategy used, for example, it's fast but inaccurate. This reflection demonstrates the emergence of metacognitive awareness. Meanwhile, in the inference aspect, students can recognize number patterns and draw simple conclusions, such as the relationship between even numbers and their multiples. This demonstrates that counting not only improves speed but also students' critical thinking skills.

Conceptually, mencongak activities can improve critical thinking skills by combining speed, accuracy, and reasoning, in line with research (Hadiyaturrido et al., 2025) that numeracy involves systematic reasoning to interpret data and make decisions based on mathematical information.

Figure 3. Students' ability to determine number patterns

Puzzle

Puzzle: These activities encourage students to develop critical and analytical thinking skills by playing with patterns and logical relationships between numbers. Numerical puzzles encourage students to learn through exploration. In interpretation, students understand the relationships between numbers concretely. In analysis, students can break down problems, identify errors, and refine strategies. In evaluation, students begin to choose more efficient methods. In inference, students can deduce numerical patterns based on experiments and observations.

This activity is effective because it improves critical and problem-solving skills, in line with the thinking (Kusumaningrum et al., 2024) that puzzles involve these skills, thereby strengthening students' understanding of numeracy.

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Quiz

The numeracy quiz was held to evaluate and cultivate quick thinking. Numerical quizzes help students understand word problems, identify key information, and choose an appropriate solution strategy. In the interpretation aspect, students can identify data. In the analysis aspect, students compare methods and analyze solutions. In the evaluation aspect, students assess the efficiency of appropriate calculation strategies. Meanwhile, in the inference aspect, students can draw logical conclusions from numerical data.

Quizzes are effective because of their competitive and reflective nature, encouraging students to think quickly and accurately. These activities encourage students to be more focused and active, thus helping them re-evaluate their understanding. These activities not only train memory but also develop analytical skills, decision-making, and logical problem-solving. This finding aligns with the thinking of who stated that numeracy learning through quizzes contributes to active student participation and improves critical thinking skills.

CONCLUSIONS AND RECOMMENDATION

The study's results indicate that literacy and numeracy practices at SDN Pendem 01 significantly improve third-grade students' critical thinking skills. Literacy activities, such as storytelling and chain reading, are effective in training students to understand text content, analyze story structures, evaluate moral values, and draw logical conclusions. Furthermore, numeracy practices such as mental calculations, puzzles, and quizzes encourage students to think quickly, recognize patterns, compare strategies, and rationally infer relationships among numbers. These findings suggest that contextual and interactive literacy and numeracy practices not only improve academic understanding but also develop reflective thinking skills appropriate to students' developmental stages.

The practical implications of this research highlight the importance of integrating literacy and numeracy habits into the learning culture in elementary schools. Educators must design diverse, meaningful, and life-relevant activities to ensure that the learning process is not mechanical but rather encourages active engagement and the development of higher-order thinking skills. School support, including policies, facilities, and educator collaboration, is also key to the consistent and sustainable implementation of literacy and numeracy habituation programs.

This study was limited to a single school context and used a descriptive qualitative approach, so the findings cannot be broadly generalized. Therefore, it is recommended that further research be conducted across schools with varying characteristics, using a mixed-methods approach, to obtain a more comprehensive picture. Furthermore, the integration of digital technology in literacy and numeracy education needs further exploration to enhance the development of students' critical thinking skills.

Credit authorship contribution statement

The first author was responsible for conceptualization, methodology, formal analysis, and data processing. The second author was responsible for providing resources, project administration, and assisting in the writing and editing of the manuscript.

Declaration of competing interests

The authors declare that they have no conflicts of interest, either financial or personal, that could influence the results of this research and the content of this manuscript. The entire research process was conducted independently and objectively, free from any external influence.

Ethical Declaration

All participants gave their consent after receiving a comprehensive explanation of the objectives and procedures, and of their right to withdraw at any time without any consequences. This study was conducted in accordance with research ethics principles and respected each participant's confidentiality.

Acknowledgment

The author would like to express his deepest gratitude to SDN Pendem 01 for granting permission, time, and opportunity to conduct this research, as well as to the principal, teachers, and students who actively participated during the observation and interview process. Thanks are also extended to the supervising lecturer, Mrs. Innany Mukhlishina, for her guidance, direction, and valuable input in the preparation of this research. Special thanks go to my parents, who always prayed for and supported me, my friend Cintami Nuryawati Sofi, who always accompanied and assisted me during the research and preparation of this journal, and my other friends, whom I cannot mention one by one, for listening to my complaints while preparing this journal and always encouraging me. Hopefully, this research can make a positive contribution to education in Indonesia.

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