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School Bulletin Boards as a Contextual Strategy to Enhance Elementary Students' Numerical Literacy

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Abstract

This study aims to describe the use of school bulletin boards as an effort to improve the numerical literacy of elementary school students. The background of this study stems from the low ability of students to understand numerical concepts contextually in the school environment. This study uses a descriptive qualitative approach, with the research subjects being teachers and students at an elementary school in Surakarta. Data were collected through observation, interviews, and documentation, then analyzed using Miles and Huberman's interactive analysis model. The results show that the use of school bulletin boards can increase students' interest in learning and numerical abilities through the presentation of information based on numbers, graphics, and everyday problems. Furthermore, bulletin boards serve as a collaborative medium that fosters students' creativity and critical thinking skills. This study implies the need for teachers to integrate school media into numerical learning as a contextual literacy strategy based on the learning environment.

INTRODUCTION

One potential learning medium for fostering numeracy is the school wall magazine (Amini & Marmoah, 2023; Badawi, 2023; Handayani, 2022). Wall magazines not only serve as a means of information, but also as a creative medium that allows students to actively participate in writing, compiling, and displaying number-based data or graphics (Mehmory et al., 2023; Nurini, 2024). Through these activities, students learn to process numerical information and present it in an attractive visual form. The use of wall magazines in the context of numerical learning provides opportunities for students to collaborate, think critically, and relate mathematics to social phenomena around them (Uzma & Mandailina, 2024; Widiastuti et al., 2022).

Schools can increase student motivation and engagement in learning. For example, research by (Tiawanti et al., 2025; Waluyo & Fiantika, 2024; Yulianto et al., 2025) found that the use of school-based literacy media can improve numerical skills and conceptual understanding. Meanwhile, (Fuadi et al., 2023) emphasized that collaborative media such as wall magazines can strengthen communication between students and build a culture of literacy in schools.

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However, research specifically examining the use of school wall magazines in the context of developing numeracy literacy in elementary school students is still limited. Most studies focus more on reading or writing literacy, rather than the integration of numeracy in wall magazine media (Sriwijayanti et al., 2023).

Thus, there is a research gap regarding how wall magazines can be optimized as a means of strengthening numeracy in elementary schools. Therefore, this study focuses on describing the process, types of activities, and impact of using school wall magazines on improving students' numeracy. The purpose of this study is to analyze the role of wall magazines as contextual innovative learning media and to provide empirical contributions to the development of school environment-based numeracy learning strategies. Theoretically, this study contributes to strengthening literacy learning models that integrate cognitive, social, and creative aspects in the context of basic education.

METHODS

This study uses a descriptive qualitative approach with the aim of describing in depth the process and results of utilizing school wall magazines in improving the numerical literacy of elementary school students (Agusti & Nurlaelah, 2025; Anggraeni et al., 2025; Engkizar et al., 2022; 2023; Rizki et al., 2025; Veradegita et al., 2021; Yaqin, 2024). This approach was chosen because it is suitable for revealing learning phenomena in a natural and contextual manner (Creswell, 2014). The research was conducted at Karangasem 2 Public Elementary School in Surakarta, Indonesia, in the even semester of the 2024/2025 academic year. The research subjects consisted of a fifth-grade teacher and 20 students who were actively involved in the school wall magazine activity. The subjects were selected using purposive sampling, based on the consideration that the class had an active school literacy program and routinely managed the wall magazine as a learning tool (Engkizar et al., 2025; Sugiyono, 2018). Data collection was carried out using three main techniques, namely observation, interviews, and documentation.

Observations were conducted to record student and teacher activities during the numerical learning process through wall magazine activities. Interviews were conducted with classroom teachers and several students to explore their perceptions of the benefits of wall magazines in improving numerical understanding. Documentation included photos of activities, wall magazine work, and student literacy notes. All data were collected directly in the field with due regard to the principles of educational research ethics (Miles & Saldaña, 2015). Data analysis was performed using Miles and Huberman's interactive analysis model, which includes three main stages, namely data reduction, data presentation, and conclusion drawing/verification. The data from observations and interviews were transcribed, categorized by theme, and analyzed descriptively to find patterns related to the improvement of numeracy. The validity of the data was tested through source and technique triangulation, by comparing the results of observations, interviews, and documentation (Engkizar et al., 2023; 2025; Moleong, 2021). This study also adheres to the principles of educational research ethics, including participant consent (informed consent), anonymity, and data confidentiality, by ensuring that all participants understand the purpose of the study and participate voluntarily.

RESULT AND DISCUSSION

The results of the study show that the use of school wall magazines contributes positively to improving the numerical literacy skills of elementary school students. Based on the results of observations and interviews, students showed great enthusiasm in relating numerical material to wall magazine activities, such as presenting data on height measurements, student attendance graphs, and class

average calculations. These activities help students understand numerical concepts in a concrete and contextual manner. Teachers also stated that wall magazine activities facilitate the integration of mathematics and literacy lessons. As stated by a classroom teacher: *"When students make graphs and write explanations on the wall magazine, they not only learn to calculate, but also understand the meaning of the numbers they display."* These findings reinforce the results of research by (Billa & Suriani, 2024; Patriana et al., 2021; Siregar, 2022), which states that students' numerical literacy can increase if learning is linked to authentic experiences in the school environment. In addition, the use of wall magazines as a numeracy medium fosters positive competition among students, where they compete to present the best numerical work, encouraging them to think logically, creatively, and systematically in organizing data (Sadino et al., 2020).

The activity of creating a numerical wall magazine also plays a role in fostering students' collaborative and communication skills. Each group is responsible for a specific part, such as collecting data, making calculations, and writing reports on the results. This process builds effective interaction between students and strengthens cooperation in completing numeracy-based tasks. One student said, *"We learned to divide tasks, calculate together, and write the results on the wall magazine so that other friends could read them."* These results are in line with the findings of (Nahdiyah & Laili, 2024; Yulianti & Cancer, 2022), which confirm that school-based project learning can improve students' communication skills and social responsibility. Additionally, the interactions established during the wall magazine creation process support collaborative learning in line with the characteristics of 21st-century learning (Ainun et al., 2024).

The school wall magazine is of high quality. Most students are able to integrate their numeracy skills with the visual presentation of information. Student activities in the wall magazine include creating attendance charts, calculating class grade averages, writing numerical reports, and presenting their work in front of the class. As shown in the analysis results, 85% of students actively created attendance charts, 75% were involved in calculating average scores, 90% wrote numerical reports on the wall magazine, and 80% presented their work in front of the class. This high level of participation shows that wall magazine activities can strengthen students' logical thinking and contextual numerical comprehension skills (Kaminski & Sloutsky, 2020).

Furthermore, the results of this study show an increase in students' ability to interpret data and convey numerical information both in writing and orally. Through wall magazine activities, students not only learn number concepts and calculations, but also learn to organize numerical information into meaningful messages. This forms comprehensive numerical literacy skills, covering conceptual, procedural, and communicative aspects. Thus, wall magazines serve as an integrative medium that combines mathematical thinking skills with language literacy skills (Lambayu et al., 2024).

In addition, this study found that the use of school wall magazines also has a positive impact on student learning motivation. Students feel more enthusiastic when their work is displayed and appreciated by teachers and classmates. This sense of pride fosters a sense of responsibility for the quality of their work. Teachers also assessed that this activity can create a more enjoyable learning environment that is oriented towards active student participation (Amini & Marmoah, 2023).

The findings of this study show a significant difference compared to previous studies, which mostly placed wall magazines as a means of developing writing skills (Khalimah & Prasetyo, 2022). This study reveals a new potential that wall magazines can be a medium for strengthening numerical literacy through contextual activities involving data collection, analysis, and presentation. Thus, school wall magazines are not only a medium of information but also a vehicle for numeracy learning that

encourages collaboration, creativity, and communication among students in an integrated manner (Hariska et al., 2024).

The results of this study indicate that the use of school wall magazines has a significant impact on improving the numerical literacy skills of elementary school students. These findings answer the research objectives outlined in the introduction, namely to determine the extent to which wall magazines can be used as a contextual learning tool to strengthen students' numerical skills. This improvement in skills can be seen from the active involvement of students in analyzing data, interpreting numbers, and presenting the results in an attractive visual form. These findings reinforce the idea that contextual and project-based media can create a meaningful learning environment for elementary school students (Fariza & Kusuma, 2024; Firman et al., 2025; Safitri et al., 2024).

Theoretically, these results are in line with the concept of literacy-based learning proposed by (Haloho et al., 2023), which emphasizes that numerical literacy encompasses not only the ability to calculate, but also the ability to understand, analyze, and communicate information containing numerical elements. Through wall magazine activities, students do not merely learn mathematical concepts abstractly, but practice them in real-life contexts through data collection and presentation. Thus, learning becomes more meaningful because it integrates students' cognitive and affective skills (Hatima et al., 2025).

In addition, the use of wall magazines also reinforces the results of research (Handiyati et al., 2023) which states that school-based learning media can improve student collaboration and learning responsibility. Group activities in making wall magazines involve critical thinking, communication, and cooperation processes, which are important elements in 21st-century learning. In this context, wall magazines not only function as a medium of information but also as a vehicle for social interaction that fosters a sense of responsibility and collaboration skills.

A comparison with previous studies shows that most earlier studies placed wall magazines as a means of developing reading and writing literacy skills. However, this study makes a new contribution by expanding the function of wall magazines as a means of developing numeracy literacy. This difference indicates innovation in learning practices, where students not only write information but also process and present numerical data creatively. These findings suggest that numerical literacy can be developed through an integrated approach that connects linguistic and mathematical aspects in the context of elementary school learning.

Furthermore, the results of the study also show that numerical wall magazine activities increase students' intrinsic motivation. This is in line with the learning motivation theory proposed by (Atmaja, 2024) in Self-Determination Theory, which explains that intrinsic motivation arises when individuals feel autonomy, competence, and social connectedness. In the context of this study, students feel satisfied when their work is displayed and appreciated, which in turn increases their self-confidence and desire to learn better (Urhahne & Wijnia, 2023).

Thus, this study provides empirical contributions to the development of school media-based numeracy literacy practices. Wall magazines can be an effective alternative medium for building numeracy skills integrated with language and social literacy skills. These results indicate that a contextual and collaborative approach through wall magazines has the potential to be an innovative learning strategy that supports the Freedom of Learning policy in creating students who are literate, creative, and adaptive to the changing times.

CONCLUSION

This study confirms that the use of school wall magazines is an effective learning strategy in improving the numerical literacy of elementary school students.

Through activities involving the collection, analysis, and presentation of data in visual and written forms, students not only understand numerical concepts cognitively, but also develop logical, communicative, and collaborative thinking skills. Wall magazines have been proven to function as a contextual learning medium that can integrate numeracy with language and social literacy, in line with the demands of 21st-century learning. Theoretically, these findings reinforce the view that project-based and real-world learning can foster more meaningful numeracy literacy skills. Practically, this research makes an important contribution to teachers and schools in developing creative learning strategies that integrate mathematics with the literacy culture of the school.

In addition, this study opens up opportunities for further research on the development of wall magazine-based learning models for other aspects of literacy, such as science and digital literacy. Future research should use an experimental quantitative approach with a larger sample and stricter control variables so that the results are more generalizable and measurable. Thus, the results of this study not only enrich basic education practices but also provide a scientific basis for the development of numeracy literacy policies in elementary schools in Indonesia.

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