

Applying Innovative Learning Media To Improve Numerical Literacy In Primary Schools

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Abstract. Improving numerical literacy in elementary schools is a major concern in the world of education in Indonesia. Several studies have emphasized the importance of using innovative and creative learning media to improve students' understanding of mathematical concepts and mathematical skills. This article examines the application of innovative learning media to improve numerical literacy in elementary schools. The method used in this study is a literature review based on articles obtained from Google Scholar and Garuda searches, with a total of 30 relevant articles over an 8-year period, namely from 2018 to 2025. The research process was carried out by identifying, studying and synthesizing research results that discuss innovative strategies in the field of numerical learning. The results of the analysis show that the use of technology-based media, educational games and interactive methods can consistently improve students' learning motivation and numerical skills. These findings emphasize the need for further development of innovative learning media to improve students' numerical literacy at the elementary level, as well as a review for references as a means to improve learning resources. This study recommends a new path in the form of using digital media as a form of innovative learning media to improve elementary school students' numerical literacy.

Keywords: media, innovative, numerical literacy, elementary school, digital

INTRODUCTION

Currently, numerical literacy is an important skill that must be mastered from an early age (Wahyuningsih, S. L., Hidayati, Y. M., & Rahmawati, 2025). This ability is not only related to understanding numbers and mathematical operations, but also includes the ability to think logically, solve problems and apply mathematical concepts in everyday life (Irawan, A., Salsabila, H., Amelia, L., & Jamiilah, 2025). Numerical literacy is defined as a person's ability to reason. Reasoning means analyzing and understanding a statement, through activities in manipulating symbols or mathematical language encountered in everyday life, and expressing the statement through writing or oral (Siregar, 2022). The definition of mathematics proficiency according to PISA focuses on students' competence in giving reasons, analyzing and communicating ideas, and effectively solving, interpreting and formulating various mathematical problems. According to the Ministry of Education and Culture, numeracy is defined as skills in

applying number concepts, as well as numeracy skills in life and the ability to interpret quantitative information around us. However, based on the 2023 PISA results, Indonesia still scores low. The average PISA score in numeracy is 366 points, 106 points away from the average score for countries in the world. In fact, the field of numeracy is the field with the largest number of students still at low levels, below level two, at 82 percent (Yuda & Rosmilawati, 2024). Therefore, the application of innovative learning media can help improve students' numerical literacy. Media such as technology, educational games, concrete manipulatives, and project-based approaches can help students understand numerical concepts in a more fun and effective way (Lestari et al., 2023). It is expected that this innovation can also promote interest and motivation in learning mathematics. Learning media is one of the tools used to support the teaching and learning process. The implication of media in the learning process is that the message to be conveyed in learning and the learning objectives to be achieved become clearer, more effective and more efficient (Fatmawati et al., 2025). This article discusses different types of innovative learning media in primary schools and identifies their impact on increasing students' numerical literacy. Thus, it is hoped that this research can provide educators with a new path in designing learning media that are more adaptive, interesting, and innovative.

METHODOLOGY

The method used in this study is SLR (Systematic Literature Review). According to the European Journal of Systematic Information, this literature review is a study of the synthesis of previous knowledge in a scientific field, demonstrating differences, interesting things and gaps in different perspectives in the existing knowledge. The results of this synthesis then become the basis and guidelines for further research. According to Priharsari (2022), the SLR method functions to determine, identify, evaluate, and interpret a collection of articles to provide answers to detailed research questions (Patras et al., 2024).

Heading 2 (If required)

The aim of this research is to find new avenues for primary education in Indonesia, especially in the application of innovative learning media to increase numerical literacy. Literature review provides a framework regarding new findings and previous findings to determine whether or not progress has been made on the results of a study (Idhartono, 2022).

Heading 3 (If required)

The scientific articles used as data are in the form of scientific articles in national journals for the period 2018 - 2025 that have been mapped via the Google Scholar and Garuda sites with the keyword "application of innovative learning media to increase numerical literacy in primary schools". The initial search identified 35 articles which were then assessed using an inductive analysis approach to identify appropriate data relating to the impact of digital reading on primary school students' literacy, resulting in 10 articles relevant to this theme being selected.

RESULTS AND DISCUSSION

The research results in this literature review are an analysis and summary of relevant articles on the application of innovative learning media to improve numerical literacy. The details and description of the study results are shown in table 1

Table 1. Results of the review of journal articles

No	Author	Research title	Year	Research results	Innovative media	New paths
1	(Kristina et al., 2021)	Development of numeracy-based learning videos for primary school students.	2021	<ul style="list-style-type: none"> - The learning videos developed are considered valid and suitable for use, with very high scores from material and media experts. - Increase students' insight into arithmetic skills. - Enthusiasm and focus for learning increases. - These media help explain the concept of numbering 	Learning videos	<ul style="list-style-type: none"> - Effective audiovisual alternative learning media - Numeracy learning media based on real-life contexts. - Use of video as the main media.
2	(Lestari et al., 2023)	Development of literacy and numeracy based learning media for	2022	<ul style="list-style-type: none"> - Poster media has proven interesting and effective in increasing students' interest in learning. 	Poster learning media	<ul style="list-style-type: none"> - Become an innovative alternative in primary schools to

No	Author	Research title	Year	Research results	Innovative media	New paths
		posters at SDN 3 Krakitan.		<ul style="list-style-type: none"> - Students show significant improvements in reading and math skills after using these media. - Become more enthusiastic in the learning process because posters are visual, simple and easy to understand. 		<ul style="list-style-type: none"> improve literacy and numeracy skills - Poster media is expanded not only for literacy and numeracy, but also for character learning.
3	(Wardani & Purwati, 2025)	Problem-based learning model with the beautiful Semarang license plate media improves the math skills of primary school students.	2022	<ul style="list-style-type: none"> - There was a significant increase in math skills in students who learned using the PBL model with number board media compared to the control group. - Students are more active in observing, thinking critically, discussing and solving numerical problems. - Increase student motivation and focus on learning. 	Beautiful license plate media	<ul style="list-style-type: none"> - The combination of the PBL approach and local, culture-based media can be an effective innovation in strengthening the math skills of primary school students. - Providing an alternative model for learning math skills that focuses on

No	Author	Research title	Year	Research results	Innovative media	New paths
						solving real-world problems and building student character.
4	(Basir et al., 2022)	Implementation of Catung Game cultural innovation to improve literacy and numeracy in primary schools.	2022	<ul style="list-style-type: none"> - The implementation of the Catung game has been proven to increase students' participation and motivation in learning. - Literacy skills increase through story questions that must be read and understood to continue the game. - Improve math skills by completing counting challenges to progress or earn points. - Students are more active, enthusiastic and cooperative during the learning process. 	Catung Games Media	Introducing a learning model based on local culture that is fun, relevant to children's contexts and revitalizes traditional games in an educational way.
5	(Oli et al., 2024)	Using Snakes and Ladders Board Media to Improve Arithmetic Understanding for	2024	The use of snake and ladder media in math games makes a positive contribution to achieving math learning outcomes in the area of simple	Snake and ladder board media	The use of technology applied to hose and ladder media (digital

No	Author	Research title	Year	Research results	Innovative media	New paths
		Class III Students at SDK Bejo.		fractions. Students are active in learning activities about the concept of adaptation, both mentally and physically.		hoses and ladders).
6	(Devi et al., 2023)	Snakes and ladders Learning media to increase the learning motivation of students in primary schools.	2023	Learning media using snakes and ladders is very suitable to implement with students to increase the mathematical arithmetic skills of primary school students.	Snakes and ladders learning media	The use of digital technology that can be applied to snake and ladder learning media.
7	(Ramadhan et al., 2023)	Implementation of Calistung Game Learning Media to increase Litnum at SDN 04 Kemuning.	2023	The application of various learning techniques using the Calistung game can maximize students' interest in learning and make students active and creative.	Calistung Game Learning Media	Teacher training on creating the Calistung game using digital media.
8	(Mumazizah et al., 2023)	Development of a snake and ladder game based on a magic box to improve the arithmetic skills of Class I primary school students.	2023	The results of the study showed that the use of magic box-based snake and ladder learning media on the arithmetic skills of Grade 1 students at SDN Tlumpu had a moderate increase.	Snakes and Ladders gaming media	The use of digital technology for the snake and ladder game media.
9	(Kero et al., 2025)	Using Snakes and Ladders Learning Media to Improve Arithmetic Understanding for	2025	The research results show that the use of snakes and ladders media can improve students' understanding	Learning media for ladders snakes	The use of technology applied to hose and ladder media.

No	Author	Research title	Year	Research results	Innovative media	New paths
		Class III UPTD SDI Ngoramawo Students.		of math skills during the learning process.		
10	(Mulk et al., 2025)	The effectiveness of puzzle media in improving elementary school students' understanding of the concept of mathematical fractions.	2025	Puzzle media has an average effectiveness of 88.84% in increasing the understanding of fraction concepts. Apart from that, these media can encourage active involvement of students, sharpen critical thinking skills and increase their learning motivation.	Puzzle media	Use of more varied puzzle media and use of digital applications.

Based on the findings from these 10 articles, 6 innovative media were found that can increase numerical literacy in primary schools. The six innovative media are learning videos, poster learning media, beautiful license plate media, calistung game media, snake and ladder learning media, and puzzle media. It is hoped that these six learning media can provide an answer to problems that often arise in improving numerical literacy in primary schools. The problems we often face include: 1) Low literacy and numeracy in primary schools; 2) Lack of innovative and interactive learning media; 3) Limited student motivation and interest in learning; 4) Low teacher innovation in learning design.

CONCLUSION

It is hoped that these six learning media can provide an answer to problems that often arise in improving numerical literacy in primary schools. The problems we often face include:

1) Low literacy and numeracy in primary schools

Literacy and numeracy are important skills to provide students with development and knowledge. However, based on various studies and data, it appears that the level of literacy and numeracy in Indonesia is still relatively low. One of the most important sources is the Program for International Student Assessment (PISA) 2022, conducted by the Organization for Economic Co-operation and Development (OECD). This study shows that Indonesia's 2022 PISA results in literacy rank 59th out of 81 countries with a score of 359. In mathematics, the country ranks 67th out of 81 countries with a score of 366. In science, Indonesia places itself in 65th position with a score of 383.(Trianjung et al., 2024). It is believed that this low score in literacy and numeracy is due to learning loss during the Covid-19 pandemic. Apart from this, factors causing low literacy and numeracy in primary schools include teaching

methods and media that do not fully meet students' needs, limited adequate teaching resources, and a lack of opportunities for students to engage in learning that encourages critical thinking and problem solving.

Therefore, a solution to improve reading and arithmetic skills in primary schools is the development of innovative media (Kero et al., 2025) In Class III students of UPTD SDI, Ngoramawo demonstrated that the Snakes and Ladders learning media was an innovative strategy for teaching mathematics, which proved to be effective in increasing students' understanding of mathematics skills and active participation.

2) Lack of innovative and interactive learning media

In the context of learning, innovative and interactive media refer to the use of different media, including text, images, audio, video and animation, which play a role in effectively presenting information to enable all types of learning. However, when implemented in the field, this learning tool is rarely used (Simarmata, 2018).

The lack of use of learning media in an educational context results in disruption of the two-way communication process or more between students and teachers, which will lead to missed views on understanding abstract material. This happens because students are not provided with concrete visualizations or representations that can help them connect concepts to real experiences, especially in material that requires logical and imaginative thinking, such as math and science. Innovative learning media enable independent learning because students have free access to them. It can even provide immediate feedback because assessments can be done instantly so students know what their strengths and weaknesses are that need improvement (Manurung et al., 2020). Learning media can support active learning by providing students with the opportunity to interact with concrete and digital media during the knowledge exploration process.

1) Limited student motivation and interest in learning

According to Witono & Wahyuningsih (2024), negative perceptions of math contribute significantly to students' low math skills, which are exacerbated by the lack of encouragement from within students to understand the material in depth. Students' low interest and motivation in learning math skills not only comes from within, but is also closely related to the way teachers provide materials that are not fully in line with the characteristics and learning needs of school-age children. The limited variety of learning methods is one of the causes of students' reduced motivation and involvement in the learning process. Learning that is too monotonous and lacks variety causes students to quickly become bored and lose their enthusiasm. Many teachers still rely on teaching methods without media or interactive activities, which makes the classroom atmosphere less lively and unattractive to students. If the learning material does not connect to real experiences or things that are close to their daily lives, students have difficulty understanding the meaning of what they learn (Dwiyanto et al., 2024). The lack of use of technology and interactive learning media in numerical learning is also a factor that makes students less motivated to learn. The use of interesting media such as learning videos,

educational games or interactive applications can make students more enthusiastic and more easily interested in the material offered (Amanda et al., 2024).

2) Low teacher innovation in learning design

Technological advances, changes in the curriculum, or the school's vision and mission cannot take away the important role of teachers in the success of student learning (Aryani et al., 2024). In terms of terminology, an innovative teacher is a teacher who is able to make changes in the learning process to create interesting and enjoyable learning using different models, media and methods. Innovative teachers should continue to be guided and trained, especially for teachers at the primary school level, because primary school graduates will determine the quality of their education at a higher level (Susanto, 2022). The main objectives of innovation, as formulated by experts, are as follows: a) improving the quality of education, both in terms of resources, facilities, infrastructure, structures and procedures; b) guaranteeing the supply of education, at primary, secondary and tertiary levels; c) Solving educational problems that have not yet been solved; (d) aligning the progress of educational science and technology in Indonesia so that it does not lag behind global progress.

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