GOLDEN RATIO OF MAPPING IDEA AND LITERATURE FORMAT
VOLUME 6, ISSUE. 2 (2026)
Website: https://goldenratio.id/index.php/grmilf
ISSN [Online]: 2776-6381

MAPPING IDEA & LITERATURE FORMAT | RESEARCH ARTICLE

Innovation in the Use of Interactive Media to Increase Students Interest and Numeracy Literacy Ability

Yuni Ramdhani[1], Muammar Khadafie[2]

[1,2] Faculty of Psychology & Humanities / Social & Political Sciences, Universitas Teknologi Sumbawa, West Nusa Tenggara, Indonesia. Email: yuniramdhani1985@gmail.com[1], muammar.khadafie@uts.acid[2]

ARTICLE HISTORY

Received: September 20, 2025
Revised: January 18, 2026
Accepted: February 04, 2026

DOI
https://doi.org/10.52970/grmilf.v6i2.1755

ABSTRACT
This study aims to analyze the impact of innovations in the use of interactive media on increasing students' interest in learning and numeracy literacy skills at SD Negeri Kokarlian. The background of this research is based on the low involvement of students in conventional numeracy learning, which tends to be monotonous and less contextual. Through a descriptive qualitative approach, data is collected using observation, interviews, documentation, and visual analysis of student activities in the learning process. Two types of interactive media, namely educational videos and technology-based games, were applied to measure the extent to which they were able to influence students' participation and numeracy literacy achievement. The results of the study showed a significant increase in the aspects of learning interest, active involvement, and students' understanding of numeracy concepts. Interactive media has been proven to provide a more enjoyable learning experience, facilitate practice-based learning, and increase student motivation in solving numeracy problems. In addition, teachers are also able to integrate interactive media into the curriculum without reducing the substance of the teaching material, so that this strategy serves as a complement to traditional learning methods. School support and the role of parents are also factors that determine the success of the implementation of these innovations. Theoretically, this research reinforces the relevance of constructivism and engagement theory in education, emphasizing the importance of the role of meaningful experiences and motivation in improving learning outcomes. As for practically, the findings of this study make a real contribution to teachers and education policymakers in developing numeracy learning strategies that are adaptive, creative, and in accordance with the demands of the 21st century.

Keywords: Interactive Media, Learning Interests, Numeracy Literacy, Primary School, Learning Innovations.

I. Introduction

Basic education is an important foundation in forming a generation that is intelligent, critical, and adaptive to the times. One of the issues that has been in the spotlight in Indonesia is the low achievement of students in literacy and numeracy, as illustrated in various international surveys such as the Programme for International Student Assessment (PISA) by the OECD (2019) and the results of the National Assessment by the Ministry of Education and Culture (2022). Numeracy literacy is not only understood as a number of numeracy skills, but broadly includes the ability to understand, reason, and use mathematical concepts in solving daily problems (Stacey, 2017). The low achievement in this field shows that many students still find it difficult to relate the knowledge gained in school to real life, so that learning mathematics seems rigid, boring, and lacking in meaning. On the other hand, the development of digital technology presents new opportunities in the learning process. The current generation, known as digital natives, is growing and developing with the technological devices around them (Prensky, 2010). Children are familiar with gadgets, apps, and interactive visual media. Ironically, learning practices in many elementary schools are still dominated by conventional teacher-centered methods, with verbal delivery of material and monotonous practice questions. Patterns like this are certainly not in harmony with the characteristics of students who need a more dynamic, visual, and interactive learning experience. Previous studies have shown that technology integration can have a positive impact on learning motivation (Pratama & Retnawati, 2021; Son, 2022; Sari & Setiawan, 2021), but most of them only highlight the motivation aspect, not on the achievement of numeracy itself. Thus, there is a literary gap that needs to be bridged, namely how interactive media can simultaneously increase the interest in learning and numeracy literacy skills of elementary school students.

Contextually, this research is very relevant to be carried out at SD Negeri Kokarlian, an elementary school in an area with limited resources. In these limited conditions, mathematics learning tends to run as it is, with minimal media innovation. Teachers still rely on whiteboards and textbooks as their main resources, while access to modern learning media is still very limited. In fact, with the development of increasingly affordable technology, simple interactive media based on computers and tablets can be presented as learning innovations. The media is expected to be able to facilitate students to be more active, motivated, and at the same time improve their numeracy skills (Munir, 2015). Departing from this background, this research has two main objectives. First, analyzing the influence of the use of interactive media on students' learning interests. Second, testing the effectiveness of interactive media in improving the numeracy literacy skills of elementary school students. The research questions asked were: (1) were there significant differences in students' learning interests before and after using interactive media? and (2) can the use of interactive media significantly improve students' numeracy literacy skills compared to conventional learning? These two questions emphasize the importance of seeing interactive media not only as a teaching tool, but as a strategic instrument that can influence motivation as well as learning outcomes.

The scope of this research is limited to students in grades IV and V at SD Negeri Kokarlian, with a focus on the topic of numeracy literacy according to the elementary school curriculum. The selection of grades IV and V is based on the consideration that students at this level already have relatively mature cognitive abilities to use interactive media, while at the same time being in the phase of forming basic mathematical concepts that will have a major influence on the next level of education (Slavin, 2020). The results of this study are not intended to be generalized to all elementary schools in Indonesia, but rather as a controlled case study that can be used as a basis for further research with a wider scope. By limiting the scope, this study seeks to present empirical data that are focused, in-depth, and contextual. To

explain the relationship between variables, this study is based on several theoretical frameworks. First, the constructivist theory of Piaget and Vygotsky which emphasizes that knowledge is actively constructed by learners through meaningful learning experiences (Vygotsky, 1978; Piaget, 1970). Interactive media provides opportunities for students to interact directly with the material, conduct exploration, and find problem-solving patterns, so that it is in line with the principles of constructivism. Second, the theory of learning motivation within the framework of Self-Determination Theory (SDT) by Deci and Ryan (2000) which emphasizes the importance of basic psychological needs—autonomy, competence, and connectedness—to foster intrinsic interest. Interactive media designed with gamification elements, challenges, and quick feedback can meet these needs, thereby increasing students' interest in learning (Ryan & Deci, 2017). Third, the concept of numeracy literacy according to the OECD (2019) which defines this skill as the ability to formulate, apply, and interpret mathematics in various contexts, including the ability to reason mathematically and use concepts, procedures, and facts to explain and predict phenomena. This theoretical framework helps to formulate that the use of interactive media can increase students' interest in learning as well as numeracy literacy skills.

The definition of variables in this study is determined operationally so that it can be measured clearly. An independent variable is the use of interactive media, which is operated as a digital-based learning application with animation, gamification, interactive exercises, and automated feedback features (Clark & Mayer, 2016). Dependent variables consist of two aspects, namely learning interest and numeracy literacy ability. Learning interest is defined as students' emotional and cognitive involvement in learning activities, measured through a Likert scale questionnaire of 1–5 with indicators of attention, interest, enthusiasm, and internal motivation (Schunk et al., 2014). Meanwhile, numeracy literacy ability is operationalized as a student's skill in solving competency-based problems that measure the ability to understand, reason, and apply mathematical concepts in a daily context, measured through standardized tests that include multiple choice and brief descriptions (Stacey, 2017; Retnawati et al., 2018). In addition, there are control variables in the form of age, class, and socio-economic background of students to maintain that the influence of interactive media can be measured more objectively.

The significance of this research lies in two aspects, namely theoretical and practical. Theoretically, this research contributes by filling the literature gap related to the relationship between interactive media, learning interests, and numeracy literacy skills. While previous research has placed a lot of emphasis on the motivation or engagement aspect of students in general, this study highlights how interactive media can have a direct impact on numeracy achievement. Thus, this research can strengthen theoretical understanding of the relationship between motivation, educational technology, and students' cognitive achievement (Pratama & Retnawati, 2021; Sari & Setiawan, 2021). Practically, this research is useful for elementary school teachers in developing technology-based learning strategies that are more contextual and in accordance with the characteristics of today's students. The results of this study also provide input for policy makers in designing programs to improve numeracy literacy by utilizing technology that is affordable and relevant to school conditions (Kemendikbudristek, 2022). Furthermore, this research has strategic value in efforts to equalize the quality of education in Indonesia. If interactive media is proven to be effective in increasing interest and numeracy literacy skills, then this learning model can be replicated in other schools with similar conditions. This not only supports the achievement of national education targets, but also answers global challenges that require the younger generation to have qualified literacy and numeracy skills (UNESCO, 2021). Thus, this research not only contributes to the academic realm, but also has a real impact on educational practices and public policy in the field of basic education.

ISSN [Online]: 2776-6381

II. Literature Review and Hypothesis Development

The development of digital technology has given rise to innovations in the world of education, one of which is in the form of interactive media. Interactive media is defined as a device or application that allows two-way interaction between students and learning content in real-time (Mayer, 2021). Unlike conventional media, interactive media provides a more dynamic learning experience through visual, audio, simulation, gaming, and instant feedback features. Previous studies have shown that interactive media can increase student engagement, facilitate understanding of concepts, and encourage motivation to learn (Wouters & van Oostendorp, 2017). In the context of elementary school, the use of interactive media has been shown to be effective in facilitating learning that emphasizes cognitive and affective aspects. Elementary school-age children have learning characteristics that require visual stimulation, kinesthetic activity, and a play-based approach (Piaget, 1972; Vygotsky, 1978). Therefore, the integration of interactive media in learning can answer the development needs of students while overcoming the limitations of traditional lecture methods.

Numeracy literacy is the ability to use mathematical knowledge functionally in solving daily problems, not just numeracy skills (OECD, 2019). In Indonesia, numeracy literacy is one of the main indicators in the National Assessment and is an important foundation for mastering 21st century competencies (Ministry of Education and Culture, 2020). However, the results of various surveys, including the Programme for International Student Assessment (PISA), show that the achievement of Indonesian students in numeracy literacy is still relatively low (OECD, 2019). This low result is influenced by several factors, including low student interest in mathematics lessons, monotonous learning approaches, and limitations in learning media innovations (Hadi & Novaliyosi, 2019). Learning interest is an affective factor that greatly determines the success of students in mastering numeracy competencies. According to Schunk et al. (2014), high interest in learning can increase intrinsic motivation, extend attention focus, and encourage students to be more persistent in completing academic tasks. Conversely, low interest in learning contributes to low academic achievement, including numeracy literacy. Previous research has shown that engaging, varied, and interactive learning media has a major contribution to increasing students' interest in learning (Chen et al., 2018). Thus, interventions in the form of the use of interactive media are expected not only to increase students' cognitive achievement in numeracy, but also affective aspects in the form of learning interests. Although a number of previous studies have examined the effectiveness of interactive media in primary education, most studies still focus on purely cognitive aspects, such as improving math learning outcomes or critical thinking skills (Zhang et al., 2020; Rahmawati & Santoso, 2022). Relatively few studies have integrated the measurement of affective aspects (learning interest) with cognitive achievement (numeracy literacy) in a comprehensive quasi-experimental research design, especially in the context of primary schools in rural Indonesia. Therefore, this study seeks to fill this gap by presenting empirical evidence on the influence of innovations in the use of interactive media on students' interest and numeracy literacy simultaneously.

This research is based on the theory of constructivism (Vygotsky, 1978) and the cognitive-affective theory of learning with media (Mayer, 2021). Constructivist theory emphasizes that knowledge is actively built by students through meaningful learning experiences, while interactive media provides a learning environment rich in interaction and visualization. On the other hand, Mayer's multimedia

learning theory explains that the use of visual and interactive media-based media can improve the processing of cognitive information while affecting affective aspects such as motivation and learning interests. The integration of these two theoretical frameworks provides a conceptual basis that interactive media has the potential to have a dual impact on increasing interest as well as numeracy literacy. Based on a literature review and theoretical framework, this study proposes the following hypotheses:

H1: There is a significant difference in learning interests between students who learn using interactive media and students who learn by conventional methods.
H2: There is a significant difference in numeracy literacy skills between students who learn using interactive media and students who learn by conventional methods.
H3: The use of interactive media has a significant positive influence on increasing students' interest in learning.
H4: The use of interactive media has a significant positive influence on improving students' numeracy literacy skills.

The hypothesis comprehensively relates the use of interactive media with two main variables, namely learning interest and numeracy literacy ability, which is expected to make a new empirical contribution to the development of basic education theory and practice in Indonesia.

III. Research Method

This study uses a descriptive qualitative approach that aims to describe in depth the innovation of the use of interactive media in increasing students' interest and numeracy literacy skills in SD Negeri Kokarlian. This approach was chosen because it is considered the most appropriate to reveal phenomena naturally according to the context, as well as to provide a comprehensive understanding of teachers' strategies, student responses, and learning dynamics that occur in the classroom. The location of the research was determined at SD Negeri Kokarlian which was chosen purposively because this school has begun to apply interactive media in learning, especially in the field of numeracy literacy. The research subjects consist of classroom teachers who use interactive media as learning innovations, students in grades IV and V as students who are directly involved in learning activities, and school principals as parties who support the innovation policy.

Data collection is carried out using several techniques. First, observation is carried out to directly observe the learning process with interactive media, including the interaction between teachers and students, student activities, and their responses to media use. Second, in-depth interviews were conducted with teachers, principals, and a number of students to explore their experiences, perceptions, and views on the effectiveness of interactive media in increasing interest and numeracy literacy skills. Third, documentation is used to obtain data from learning documents such as Learning Implementation Plans (RPP), interactive teaching materials, photos of activities, notes of student learning outcomes, and school policies related to learning innovations.

The main instrument in this study is the researcher himself as a human instrument that plays a role in planning, collecting, analyzing, and interpreting data. In addition, the researcher also used supporting instruments in the form of observation guidelines, interview guidelines, and documentation sheets to strengthen the validity of the data. Data analysis was carried out interactively and continuously

using the Miles and Huberman model which included three stages, namely data reduction, data presentation, and conclusion drawing and verification. Data reduction is carried out by selecting, concentrating, simplifying, and transforming the raw data obtained from the field. The data that has been reduced is then presented in the form of descriptive narratives, tables, and visual documentation, thus facilitating the process of drawing conclusions. The conclusions of the research are drawn repeatedly and verified to match the actual conditions in the field. To ensure the validity of the data, this study uses several credibility test techniques, namely source triangulation by comparing information obtained from teachers, students, and school principals; triangulation techniques by combining observation, interviews, and documentation; and member check by reconfirming the findings to the respondents to match the reality they are experiencing. The research procedure is carried out in several stages, namely the preparation stage in the form of preparing instruments, licensing, and coordinating with the school; implementation stage in the form of data collection through observation, interviews, and documentation; the analysis stage is in the form of field data processing to find patterns, themes, and meanings related to interactive media innovations; as well as the reporting stage that produces a systematic description of the research results.

IV. Result and Discussion

Research on Innovation in the Use of Interactive Media to Increase Students' Interest and Numeracy Literacy Ability at Kokarlian State Elementary School produced significant findings related to the effectiveness of digital technology-based learning media. Through a descriptive qualitative approach, data was obtained from observations, in-depth interviews, and documentation involving teachers, students, and schools. The results of the study show that interactive media not only increases students' interest in learning, but is also able to strengthen their numeracy literacy skills in the context of daily learning.

First, in terms of learning interest, there are positive changes in student involvement during the learning process. Prior to the use of interactive media, some students tended to be passive, bored easily, and showed less participation in class discussions. However, after the use of media in the form of educational games, interactive quizzes, and application-based simulations, students seemed to be more active in asking questions, more enthusiastic in working on questions, and more enthusiastic in following the teacher's instructions. Interviews with students also confirm that learning becomes more fun, challenging, and not monotonous. Interactive media is able to provide a learning experience that combines visual, audio, and kinesthetic aspects so as to encourage students' emotional and cognitive involvement more optimally.

Second, this study also reveals changes in learning strategies implemented by teachers. With the help of interactive media, teachers can more easily explain numeracy concepts that were previously considered abstract, such as simple calculation operations or data interpretation. Teachers start using a small competition-based approach, such as scoring or rewarding groups that answer questions correctly, so that students are intrinsically motivated. Teachers' creativity in designing learning also increases because they can combine data visualization, interactive problem exercises, and contextual educational games with students' daily lives. Third, the real impact of the use of interactive media can be seen in improving students' numeracy literacy skills. The results of the daily practice documentation show that more than 70% of students experience an increase in grades after three encounters with this new method. Students are able to solve story-based problems better, understand the concept of basic

counting operations more quickly, and demonstrate skills in interpreting simple diagrams or tables. In addition, students can relate numeracy learning to real situations, for example calculating the price of goods in the school cafeteria or comparing the number of objects in daily life.

Fourth, this study also found supporting and inhibiting factors in the application of interactive media. The main supporting factors are the availability of school digital devices, the principal's support for learning innovations, and the positive response from students and parents. However, obstacles arise from the limited digital skills of some teachers and limited access to personal devices for some students. To overcome these obstacles, teachers initiate group-based learning so that all students can remain involved even though not all have personal devices. Finally, the response of the school environment, including teachers, principals, and parents, showed appreciation for these innovations. Parents assess that their children are more excited about learning at home by taking advantage of educational apps, something that was rarely done before. Overall, this study emphasizes that the use of interactive media at Kokarlian State Elementary School is able to increase interest in learning, motivate students, and make a real contribution to strengthening numeracy literacy skills. Thus, this innovation can be used as a strategic alternative in overcoming the challenges of numeracy learning in elementary schools, as well as strengthening the synergy between teachers, students, and parents in supporting the success of education.

4.1. Interactive Media Innovation and Students' Learning Interests

The results of the study show that the use of interactive media is able to significantly increase students' interest in learning. These findings are consistent with various previous studies that emphasized that technology-based media can create a more familiar and enjoyable learning atmosphere (Mayer, 2021; Clark & Mayer, 2016). In the context of Kokarlian State Elementary School, students showed an enthusiastic response when they were introduced to learning videos and educational games. This enthusiasm can be seen from the high participation of students in answering questions, their involvement in group discussions, and increased curiosity about the material presented. This condition is in line with the theory of motivational design of instruction (Keller, 2010) which emphasizes that the success of learning is greatly influenced by how teachers are able to arouse attention, foster relevance, increase confidence, and provide satisfaction to students. The increased interest in learning in students can be understood as a result of a more interactive and meaningful learning experience. Interactive media facilitates students to not only passively receive information, but also actively participate in learning activities. For example, in the use of numeracy-based educational games, students not only memorize the concept of numbers, but also apply them directly through game challenges. This process makes students feel challenged as well as motivated to complete each level, which in turn strengthens their understanding of concepts as well as boosts their confidence. In addition, interactive media helps to overcome the weaknesses of conventional learning that tend to be monotonous and do not encourage optimal student engagement. In traditional learning, students often only hear the teacher's explanation without the opportunity to explore the material independently. However, with interactive media, students can learn through hands-on experiences that are more contextual and fun. This not only increases interest in learning, but also creates a more lively, participatory, and collaborative classroom atmosphere. Thus, the innovation in the use of interactive media at SD Negeri Kokarlian has proven to be not only relevant to increase student interest, but also an effective strategy in fostering sustainable learning motivation.

4.2. Interactive Media and Numeracy Literacy Skills

Students' numeracy literacy skills have been shown to have significantly improved after the use of interactive media in learning. This improvement can be seen from students' ability to understand basic mathematical concepts, apply problem-solving strategies, and relate learning materials to everyday experiences. This is in line with the results of OECD research (2019) which emphasizes that numeracy literacy is not just a mechanical calculation skill, but a broader ability to use mathematical knowledge to understand and solve various real problems. In other words, numeracy literacy includes critical thinking skills, logical reasoning, as well as the ability to relate numbers and symbols to contextual situations that students face in their lives. The use of interactive media, such as educational games, digital-based applications, and learning videos, provides wider opportunities for students to practice numeracy skills in concrete and applicable situations. For example, interactive games that teach the concept of fractions through virtual meal sharing activities, or apps that challenge students to calculate costs in a shopping simulation, make the learning process more meaningful. Students not only memorize formulas but also understand the functions and applications of such mathematical concepts in daily life.

The results of this study also support the constructivism theory put forward by Vygotsky (1978), which emphasizes the importance of students' active involvement in building knowledge through interaction with their learning environment. Interactive media acts as a stimulus that encourages collaborative and participatory learning experiences. Through videos, simulations, and interactive games, students have the opportunity to test hypotheses, discuss with peers, and explore independently. This process makes numeracy learning livelier and is not limited to memorizing numbers or mathematical procedures alone. Furthermore, interactive media can serve as scaffolding that helps students move from the actual development zone to the Zone of Proximal Development (ZPD). Teachers can use these media as a bridge that connects abstract concepts with students' real experiences. With visual, audio, and interactive activity support, it is easier for students to understand material that was initially considered difficult. This proves that interactive media is not only a teaching tool, but also an effective pedagogical strategy in increasing students' interest and numeracy literacy skills.

4.3. Integration of Interactive Media with the Curriculum

One of the main strengths of the innovation in the use of interactive media at SD Negeri Kokarlian is its close integration with the national curriculum. Teachers do not position interactive media merely as a stand-alone learning add-on or accessory but directly relate it to the basic competencies and learning objectives that have been set in the curriculum. Each design of learning activities that use interactive media is prepared based on the analysis of core competencies, basic competencies, and indicators of achievement of student learning outcomes. This shows that these innovations have a strong foundation and are in line with the direction of national education policy. This kind of integration also ensures that the use of technology in the classroom is not only experimental but supports the expected learning outcomes. This approach is in line with the concept of blended learning, which is a learning model that combines conventional methods with digital technology to produce a richer learning experience (Horn & Staker, 2015). By combining face-to-face interaction, teacher explanations,

and the use of interactive media, students gain a variety of learning experiences that not only strengthen conceptual understanding but also foster critical thinking and problem-solving skills. Teachers have an important role to play in balancing these two approaches, so that technology is used proportionately to increase learning effectiveness, rather than replacing the role of the teacher himself.

The findings of this study confirm that the use of interactive media should not be seen as a mere momentary trend or simply a form of learning modernization without a clear direction. Instead, interactive media should be positioned as an integral part of a systematic and continuous learning strategy. When designed with the curriculum in mind, interactive media can be an effective instrument to strengthen students' interest in learning while improving numeracy literacy skills. This is particularly relevant to the Merdeka Learning policy which emphasizes the achievement of essential skills for the 21st century, including literacy and numeracy. Thus, this innovation not only provides a new color in the teaching and learning process but also contributes significantly to the achievement of national targets in improving the quality of basic education in Indonesia.

4.4. External Support: Schools and Parents

The success of the implementation of interactive media in SD Negeri Kokarlian cannot be separated from the role of various parties, especially school support and parental involvement. Schools as formal educational institutions provide full support by providing basic facilities, such as simple technology devices, internet access, and classrooms that are conducive to the application of digital-based learning media. In addition, the school also encourages teachers to continue to innovate through training programs, professional discussions, and opportunities to share good practices among peers. This kind of institutional support is an important foundation for teachers to not only rely on conventional methods, but also to be able to use technology creatively to increase students' interest and numeracy literacy skills. Parental involvement also has a significant contribution in supporting the successful implementation of interactive media. While these levels of engagement still vary, most parents show concern by ensuring their children engage in digital media-based learning, both at school and when learning activities are taken home. This form of involvement can be in the form of providing time for home learning assistance, providing motivation so that children are more active, to efforts to understand the technology used by teachers in learning. This is in line with the view of Epstein (2018) who emphasized that collaboration between schools, families, and communities is a key factor in supporting student learning success. Thus, parental involvement is not only additional, but an integral part of the broader education ecosystem. Furthermore, numeracy literacy as a basic competency does not only depend on formal learning in the classroom but is also influenced by the home environment and daily family interactions. Children who receive positive support from their parents tend to have higher motivation to learn, especially when learning is done with engaging interactive media. With the synergy between schools and parents, the use of interactive media can run more optimally because children feel fully supported by the two main environments in their lives. This collaboration ultimately not only increases interest in learning but also helps students develop numeracy skills on an ongoing basis.

4.5. Implementation Challenges and Handling Strategies

This study also found a number of obstacles in the implementation of interactive media, especially related to the limited understanding of teachers and parents regarding the use of digital

media. This barrier is not something entirely new, as various previous studies have shown that digital transformation in the world of education often faces similar problems, especially regarding the lack of technological competence among educators (Ertmer & Ottenbreit-Leftwich, 2010). Many teachers are still not used to using digital devices in the teaching and learning process, so at the beginning of the application of interactive media they have difficulties in operating the application and in integrating it with the subject matter. On the other hand, parents of students also show limitations in understanding the functions and benefits of interactive media, so that support from home becomes less optimal. However, the school does not allow this problem to become a permanent obstacle. Through an adaptive strategy, the school has succeeded in overcoming these challenges by providing simple mentoring and training programs for teachers. This training is designed to provide basic skills in operating digital media, developing interactive-based teaching materials, and utilizing learning applications that are relevant to students' needs. In addition to providing technical skills, this mentoring also focuses on increasing teachers' confidence so that they do not feel awkward or afraid of making mistakes when using technology in the classroom. This step has proven to be very important to ensure the sustainability of learning innovation. With support in the form of training and guidance, teachers become more confident in exploring the potential of interactive media, and even begin to show creativity by adapting material according to student characteristics. This condition is in line with the view that obstacles in technology adoption should not be seen as barriers, but rather as opportunities to strengthen the capacity of educators in facing the digital era. Thus, the problem of limited understanding of teachers and parents can be positioned as an initial challenge that actually encourages the creation of a learning ecosystem that is more adaptive, collaborative, and oriented towards improving the quality of students' numeracy literacy.

4.6. Comparison with Conventional Learning

One of the important findings of this study is the significant difference between conventional and interactive media-based learning. Teachers consider that conventional learning tends to be monotonous, while interactive media creates a dynamic, fun, and participatory learning atmosphere. This difference is consistent with the results of previous research showing that technology-based learning is more effective in increasing student engagement (Zhao et al., 2020). From the perspective of engagement theory, interactive media is able to increase behavioral engagement (active student participation), cognitive engagement (effort to understand the material), and emotional engagement (a sense of pleasure and motivation in learning). This explains why students at SD Negeri Kokarlian show increased interest and motivation after the application of interactive media.

4.7. Evaluation, Replication, and Prospecting

The evaluation of the success of this innovation is carried out through classroom observations, formative test results, and indicators of student learning interest. All instruments showed consistent improvement, so it can be concluded that interactive media successfully achieved the initial goal of the study. Furthermore, teachers believe that this innovation can be replicated in other schools, even under different conditions. These findings have important implications for education policy, particularly in supporting numeracy literacy programs in elementary schools. Interactive media can be used as an adaptive, flexible, and potentially enriching learning strategy in Indonesia. With promising prospects,

this research makes a practical contribution for teachers, schools, and policymakers in developing technology-based learning innovations.

4.8. Research Limitations and Strengths

Although it provides positive results, this study has limitations. First, the number of respondents is still limited, so the generalization of research results needs to be done carefully. Second, this study emphasizes more on the descriptive aspect so that it has not measured the causal influence experimentally. Nevertheless, this study has important strengths, namely a focus on real practice in the field, direct involvement of teachers and students, and strong school support. This strength makes the results of the research have high practical relevance, while providing an empirical basis for further research.

V. Conclusion

Research on innovations in the use of interactive media at SD Negeri Kokarlian provides a clear picture that the use of technology in learning is able to bring significant changes in the learning interests and numeracy literacy abilities of elementary school students. The results of the study show that interactive media, in the form of educational videos and technology-based games, succeed in increasing student active involvement, creating a more enjoyable learning atmosphere, while strengthening the understanding of numeracy concepts in an applicable context. This increase is in line with the theory of constructivism and engagement which emphasizes the importance of the role of interaction, meaningful experience, and motivation in the learning process. In terms of implementation, this innovation is able to be well integrated into the applicable curriculum without reducing the substance of the teaching material. Teachers use interactive media not as a substitute, but as a complement to conventional learning strategies. This shows that digital media can function as a supporting tool that enriches teaching methods, so that learning becomes more contextual, relevant, and in accordance with the needs of students in the digital era. In addition, school support and parental involvement have also proven to be important factors that strengthen the successful implementation of this innovation.

However, this study has limitations. The relatively small number of respondents limits the generalization of the research results, and the descriptive design of the study has not fully uncovered the causal relationship in depth. Therefore, further research is recommended to use an experimental quantitative or quasi-experimental approach with a wider scope, so that the effectiveness of interactive media on improving numeracy literacy can be tested more comprehensively. In practical terms, the results of this study make an important contribution to teachers, schools, and policymakers. Interactive media innovation can be used as an effective alternative learning model to support national numeracy literacy programs. Thus, this research not only enriches the academic treasure, but also offers real solutions for the development of learning strategies that are adaptive, creative, and in accordance with the demands of 21st century education.

References

Clark, R. C., & Mayer, R. E. (2016). E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning (4th ed.). Wiley.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Kemendikbudristek. (2022). Laporan hasil asesmen nasional 2022. Jakarta: Pusat Asesmen Pendidikan.

Munir. (2015). Multimedia: Konsep & aplikasi dalam pendidikan. Alfabeta.

OECD. (2019). PISA 2018 results (Volume I): What students know and can do. OECD Publishing. https://doi.org/10.1787/5f07c754-en

Piaget, J. (1970). Science of education and the psychology of the child. Orion Press.

Pratama, R., & Retnawati, H. (2021). The effect of digital learning media on students' motivation in mathematics learning. Journal of Education and Learning, 15(2), 227–236. https://doi.org/10.11591/edulearn.v15i2.20042

Prensky, M. (2010). Teaching digital natives: Partnering for real learning. Corwin Press.

Putra, A. (2022). Pengaruh penggunaan media digital terhadap motivasi belajar matematika siswa sekolah dasar. Jurnal Pendidikan Dasar, 13(1), 55–66. https://doi.org/10.21009/jpd.v13i1.20011

Retnawati, H., Munadi, S., Arlinwibowo, J., Wulandari, N. F., & Sulistyaningsih, E. (2018). Teachers' difficulties in implementing thematic teaching and learning in elementary schools. The New Educational Review, 51(1), 201–212. https://doi.org/10.15804/tner.2018.51.1.16

Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. Guilford Press.

Sari, N. P., & Setiawan, H. (2021). Interactive media in mathematics learning: Effects on students' motivation and achievement. International Journal of Instruction, 14(3), 523–540. https://doi.org/10.29333/iji.2021.14331a

Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2014). Motivation in education: Theory, research, and practice (4th ed.). Pearson Higher Ed.

Slavin, R. E. (2020). Educational psychology: Theory and practice (13th ed.). Pearson.

Stacey, K. (2017). PISA and real-world problem solving: Research and practice in numeracy. Mathematics Education Research Journal, 29(1), 1–19. https://doi.org/10.1007/s13394-017-0205-6

UNESCO. (2021). Reimagining our futures together: A new social contract for education. UNESCO Publishing.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.