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SIPINTAR: A MOOC-Based Platform to Improve Reading Learning Outcomes

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Abstract

Background:
This study is motivated by the pressing challenge of improving reading skills among elementary school students in rural areas, particularly in the research area, where access to quality educational resources is limited. This research aims to assess the effectiveness of the "Sipintar" MOOC-based platform in enhancing students' reading abilities, addressing a critical need in these underserved regions.

Methodology:
The study employed a quasi-experimental design, specifically a one-group pretest-posttest format. The sample comprised 72 fourth-grade students from four different elementary schools. Reading ability data was collected through standardized reading tests conducted before and after the intervention, and the results were analyzed using paired t-tests to determine the significance of any improvements.

Findings:
The results demonstrated a significant improvement in students' reading abilities after using the Sipintar platform. Most students exhibited marked progress, proving the platform's efficacy in boosting reading performance among elementary students in rural settings.

Conclusion:
The Sipintar platform has proven to be an effective tool for improving reading skills among elementary school students in the research area. Given its success, the platform holds promise for broader implementation in other remote regions facing similar challenges in access to quality educational materials.

Originality:
This study fills a critical gap by offering empirical evidence on the effectiveness of a MOOC-based platform for enhancing reading skills in rural areas, where educational resources are frequently inadequate.

Keywords	:	Reading Skills; MOOC; Elementary Education; Sipintar Platform
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1. INTRODUCTION

The current technological developments continue to advance rapidly, with a transition from the 4.0 era to Society 5.0, where humans become the center of innovation. The 4.0 era is known for introducing automation and digitization in industrial production, significantly enhancing operational efficiency and productivity (Mourtzis et al., 2022). However, Society 5.0, which emerges as a continuation of this era, places humans at the core of technological innovation, aiming to improve the overall quality of life (Aquilani et al., 2020).

As the center of innovation, humans in the 5.0 era take on a more dominant role in developing and applying technologies such as AI and IoT. While in the 4.0 era, these technologies were primarily focused on improving efficiency, in the 5.0 era, they are now aimed at enhancing human quality of life by prioritizing human well-being (Nahavandi, 2019).

Society 5.0 leverages advanced technology to balance economic progress and quality of life, focusing on integrating physical and virtual spaces to achieve larger social goals and enhance overall human well-being (Özdemir & Hekim, 2018). This concept aims to create a super-smart society that utilizes big data and AI to support better decision-making in various aspects of life (De Felice et al., 2021).

For example, Massive Open Online Courses (MOOCs) in the 4.0 era enabled broader access to education through digital platforms. However, in the 5.0 era, MOOCs adapt to better meet individual needs by tailoring content to enhance quality of life and personal skills (Darmaji et al., 2019).

The transition from the 4.0 Era, which focused on efficiency and automation through technology, to Society 5.0, which places human well-being as the top priority, brings about fundamental changes across various fields, including education. This transformation not only shifts the way technology is used in industries but also influences educational approaches, where technology is increasingly focused on enhancing individual quality of life and well-being. In this context, MOOCs have become a key innovation, evolving to meet the demands of Society 5.0 by offering more personalized and interactive learning materials, designed to cater to individual needs and support the development of better personal skills (Agustina et al., 2023).

When this concept is applied in Society 5.0, MOOCs serve as tools for disseminating knowledge and are designed to meet individual needs in enhancing skills and knowledge. This aligns with the principles of Society 5.0, which focus on improving human quality of life and positioning education as a vital tool for individual empowerment (Ferreira & Serpa, 2018).

The effectiveness of MOOCs is greatly influenced by course design and the ability of technology to support interaction (Tzovla et al., 2021). Their implementation requires more interactive teaching methods that directly engage students, as demonstrated to be effective in the Self-Regulated Strategy Development approach for improving students' reading skills (Ray et al., 2023). Therefore, adapting learning materials in line with student progress is key to ensuring the effectiveness of MOOCs (Syazali et al., 2023).

The advantages of MOOCs as an effective training medium stem from the quality of information they provide, which directly and significantly impacts ease of use and perceived benefits. When the information presented in a MOOC is considered high-quality, such as being clear, relevant, and easy to understand, users find the platform easier to navigate. Moreover, users who perceive the information in MOOCs as high-quality are more likely to view the platform as a valuable tool for achieving their learning goals. They are more inclined to believe that using the MOOC will help them acquire the necessary knowledge or skills (Harnadi et al., 2024).

An important aspect of the success of any technology is closely linked to reading competence. This is because reading skills are a fundamental competency in the 5.0 era (Pratama et al., 2022). Reading skills relate to an individual's ability to understand, analyze, and interpret information presented in text form (Sandhakumarin & Tan, 2023). It involves the recognition of words and sentences and the ability to connect that information with prior knowledge and apply it in real-life contexts (Istianah, 2023).

A person is considered literate when they can identify and understand the meaning of the text they read, draw relevant conclusions, and critically evaluate information objectively (Nuryadi & Widiatmaka, 2023). Beyond merely understanding words, reading skills in the 5.0 era also encompass the ability to filter accurate information from misinformation and develop a critical and solution-oriented perspective on the issues they encounter.

Although technology has advanced rapidly, its application in education has not yet been fully experienced by individuals in Indonesia, particularly at the elementary school level, in supporting reading skills. This situation arises because, while many teachers in Indonesia understand the importance of teaching reading, they still face significant challenges in improving students' reading abilities due to the limitations of the strategies and teaching materials they user (Nurkamto et al., 2021).

Reading difficulties among elementary school students include problems in identifying or distinguishing letters; difficulties in arranging letters and syllables to read a word, especially

combinations of vowels and consonants; struggles with transforming words; frequent omission of letters in word structures; lack of attention to punctuation; difficulties with spelling; inability to pronounce phonemes, diphthongs, double vowels, and double consonants; deficiencies in letter pronunciation and vocabulary mastery; challenges in reading complete sentences and meaningful words; as well as frequent instances of omission, reversal, insertion, and substitution of words while reading. Additionally, they face reading fluency and comprehension challenges during aloud reading (Fauziah & Desiani, 2024).

Various studies on using MOOCs as learning media have been conducted in different countries. In Brazil, MOOCs have been proven to increase student interest in blended learning Ivashkina et al. (2022) in India, MOOCs effectively supported distance education during the pandemic (Abhishek et al., 2023) and in China, research has focused on MOOC trends and research methods, emphasizing the use of data from MOOC platforms and survey techniques, as well as proposing the use of new technologies such as Big Data to develop MOOC research further (Cheng et al., 2023). In Indonesia, similar research has also been conducted, primarily focusing on university and upper secondary school students, with results showing improvements in geographical literacy through the STEM approach (Lathifah, 2024; Purwanto et al., 2024).

Research on MOOCs for elementary school students has not yet been conducted. Such research is necessary because it can provide information about how MOOCs impact students' reading abilities. The findings obtained could serve as a foundation for further developmental studies in reading instruction. Teachers can also use the results as a basis for selecting instructional media. Therefore, this research aims to analyze the effectiveness of the Sipintar MOOC model on the reading abilities of elementary school students in the research area district. The use of MOOCs in elementary education in the research area district, which may face challenges related to accessibility and limited educational resources, offers a promising solution.

By utilizing digital technology, the Sipintar platform can reach students in remote areas, providing access to high-quality learning materials that are unavailable locally. This helps bridge the educational gap between urban and rural areas and contributes to achieving more inclusive and equitable education goals across regions.

This research will explore how the Sipintar platform can improve reading learning outcomes for elementary school students in the research area. The study is designed as a comprehensive study, aiming to gain in-depth insights into MOOCs' effectiveness in

elementary education and how technology can be used to address challenges in teaching reading.

This research aims to identify key factors influencing the successful implementation of MOOCs at the elementary school level, providing a reference for similar applications in other regions. It seeks to address the challenges faced in implementing educational technology at the elementary level, particularly in remote areas like the research area.

By focusing on the use of MOOCs as a tool to enhance reading skills, this study not only contributes to the existing academic literature but also offers practical solutions aligned with the vision of Society 5.0, which aims to create more inclusive education focused on improving quality of life.

The results of this research are expected to serve as a model for other regions in Indonesia in implementing effective educational technology, which can ultimately help reduce educational disparities and improve the overall quality of elementary education. A thorough literature review indicates that MOOCs' psychological and pedagogical effectiveness has a significant positive impact on students' learning processes. (Jamebozorg et al., 2022).

This research is expected to contribute to existing academic literature and offer practical recommendations for educators and policymakers in designing and implementing more effective technology-based learning programs in the future.

Research on the effectiveness of learning strategies in MOOCs has shown that a combination of appropriate pedagogical approaches and technology can significantly improve students' reading abilities (Tsiriotakis et al., 2020). This research is also relevant to the growing global trend where education is increasingly personalized and enhanced by digital technology.

In an era where online education and distance learning are becoming increasingly common, platforms like Sipintar can play a crucial role in shaping the future of education. By providing the necessary tools and resources to support student learning wherever they are, this platform can help address the various challenges faced by traditional education systems and foster a broader transformation of education.

For example, the use of MOOC platforms in the context of English language learning at technical universities has been shown to significantly improve students' communication skills and their understanding of academic material. This demonstrates the great potential of MOOCs in supporting better education outcomes (Akhmetova et al., 2023).

The importance of this research is also tied to the potential for improving reading competencies among elementary school students. Reading skills are a critical foundation for

academic success at higher levels, and interventions designed to enhance these skills have significant long-term impacts. Previous studies have shown that approaches combining digital learning with direct interaction can significantly improve students' reading abilities, leading to better overall academic outcomes (Osiyanova & Osiyanova, 2023).

2. METHODOLOGY

This study employs a quasi-experimental design using a one-group pretest-posttest approach. Quasi-experiments are a type of research aimed at testing the existence and degree of causal relationships from the intervention given (Creswell, 2015). The one-group pretest-posttest design is an approach where a study focuses on findings based on evaluating objective results. This research design tests a single group of participants before the intervention (pretest). After the intervention is given, posttest data are collected using the same measures. The intervention is considered beneficial if a significant difference is found between the pretest and posttest scores.

The research was conducted from January to June 2024. Prior to data collection, parental consent forms were distributed and obtained to ensure compliance with ethical standards in research involving minors. The independent variable in this study is the use of the Sipintar MOOC platform, while the dependent variable is the students' reading abilities." The independent variable in this study is the use of the Sipintar MOOC platform, while the dependent variable is the students' reading abilities. The study involves 4th-grade students in elementary schools in the research area district as the research population, focusing on students transitioning from lower to higher grades. There are 15 elementary schools in this district, where the students' characteristics are relatively homogeneous regarding access to technology and basic reading skills. The selected schools were chosen based on their B accreditation status and their homogeneity in students’ access to technology and reading abilities, which ensured a controlled environment to assess the impact of the Sipintar MOOC platform. Therefore, stratified random sampling was applied using the Krejcie and Morgan formula to determine the sample. Therefore, stratified random sampling was applied using the Krejcie and Morgan formula to determine the sample.

As a result, four elementary schools with B accreditation were selected as the sample.

Here are the number of students in each selected school:

Table 1. Number of Research Samples

Number of Students (Grade 4)	Age Range (years)
15	10-12
25	10-12
26	10-12
22	10-12

The total number of students is 88, aged 10 to 12 years. Based on calculations using the Krejcie and Morgan formula, the required sample size is 72 students.

Krejcie and Morgan Formula:

Adaptation **: (Krejcie et al., 1996)**

$$n = \frac{X^2.N.P(1-P)}{(N-1).d^2 + X^2.P((1-P)}$$

Explanation**:**

n = required sample size

N = population size

χ2\chi^2χ2 = Chi-square value

P = population proportion

d = margin of error

$$n = \frac{3.841 \cdot 88 \cdot 0.25}{87 \cdot 0.0025 + 3.841 \cdot 0.25}$$

$$n = \frac{84.883}{10.2175 + 0.96025}$$

$$n = \frac{84.883}{1.17775} = 72.06$$

Data Collection Methods included pre- and post-intervention reading tests to assess changes in students' reading abilities, observations to capture behavioral data on student engagement and motivation during Sipintar sessions, a 5-point Likert scale survey to measure motivational indicators such as engagement, enthusiasm, persistence, and interest before and after the intervention, and participant observations focused on indicators such as active participation in discussions, responsiveness to multimedia content, and peer interactions (Deci & Ryan, 2013). Additionally, semi-structured interviews were conducted to assess students' viewing skills, focusing on their ability to interpret and connect visual elements in Sipintar. The responses from these interviews were categorized into high, moderate, and low levels of viewing skills (Serafini & Gee, 2017).

Data Analysis involved using a paired-sample t-test to assess the mean score differences between pretest and posttest scores in reading abilities, a standard method in educational research (Croucher & Cronn-Mills, 2018). Descriptive statistics were applied to the motivation survey data to obtain averages and distributions of motivation scores pre- and post-intervention. Qualitative analysis was performed on viewing skills interview responses, categorizing students' responses into high, moderate, and low levels. Descriptive and inferential statistical analyses were also conducted to describe score distributions, providing an overall picture of the changes observed as a result of the intervention (Samuels, 2015). This approach offers a comprehensive analysis of Sipintar's impact on reading abilities, motivation, and viewing skills, providing insights into the effectiveness of interactive multimedia in enhancing educational outcomes.

3.FINDINGS

Based on the data collected from 4 public elementary schools in the research area District, the selected region Regency, the author used a test instrument in the form of a pre-test to evaluate reading material learning before the implementation of the Sipintar program. This study aims to obtain a clear picture of the reading abilities of 4th-grade students before the Sipintar implementation. As shown in Figure 1, the Sipintar platform provides interactive modules that support students in improving their reading skills.

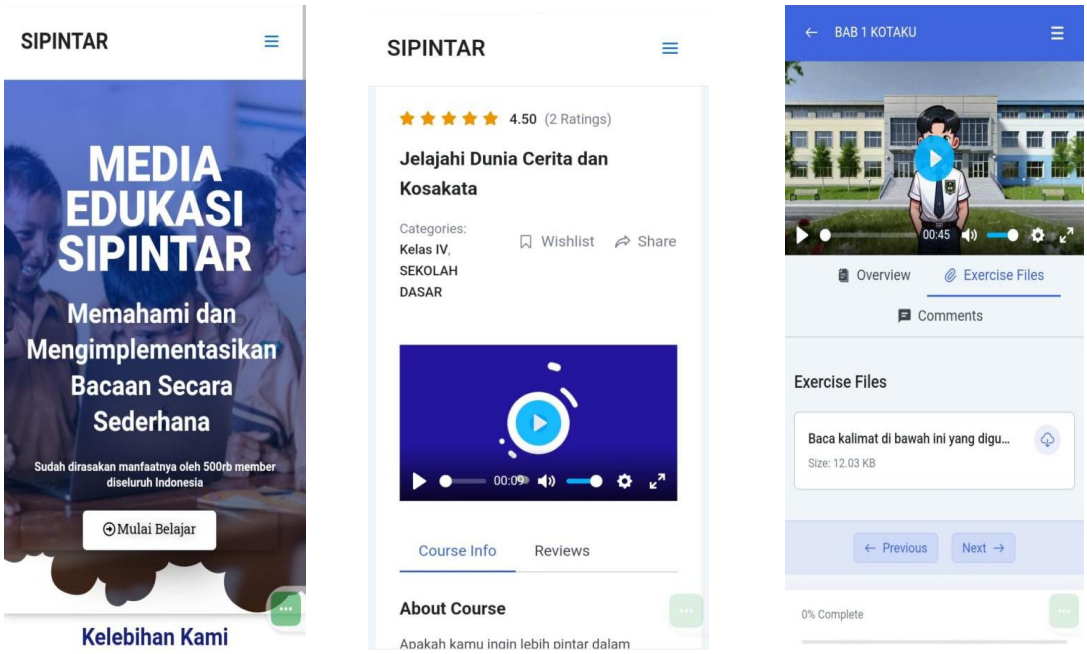

Figure 1. The main interface of the SIPINTAR platform used during the pre-test process

In the descriptive statistical analysis, the processed data includes pre-test results collected from 5th-grade students in the four schools. This analysis includes measuring the pre-

test results' highest score, lowest score, average (mean), and standard deviation. By analyzing this data, the author aims to provide in-depth insight into the students' reading ability levels before implementing Sipintar. These statistical data are expected to provide a general understanding of student performance and support the evaluation of the effectiveness of the Sipintar program after its implementation. This analysis is also crucial for identifying areas that require special attention and designing appropriate interventions to improve students' reading skills.

Table 2. Results of Descriptive Analysis of the Pre-Test

No.	Descriptive Statistics	Pre-test
1	·Number of samples	72
2	·Lowest score	21
3	·Highest score	67
4	·Total score	3246.5
5	·Average score	45.09
6	·Standard deviation	11.04

Based on Table 2, the students' reading scores show a lowest score of 21 and a highest score in the pre-test of 67. The average pre-test score is 45.09, with a standard deviation of 11.04. Table 2 displays the pre-test categories.

Table 3. Pre-test Categories of Reading Results for 4th Grade Students

Score Range	Category	Pre-test	
		Frequency	Percentage
80-100	Excellent	0	0.0%
70-79	Good	0	0.0%
60-69	Fair	10	13.9%
45-59	Poor	24	33.3%
<44	Satisfactory	38	52.8%
	Total	72	100%

Based on the research results, Table 3 provides an illustration of the students' reading abilities before utilizing Sipintar and being given the initial test (pre-test). The results show significant variation in abilities among the students. From the data obtained, none of the students fell into the "Excellent" category (80-100), indicating that there is still room for improvement in reading skills at the highest level.

A total of 10 students, or 13.9%, fell into the "Fair" category (60-69), indicating a reading proficiency level that requires further strengthening to achieve more optimal results.

Meanwhile, 24 students, or 33.3%, were classified under the "Poor" category (45-59), indicating that a significant portion of the students still need intensive guidance to improve their reading skills.

The most dominant group, consisting of 38 students or 52.8%, fell into the "Satisfactory" category (<44), indicating a significant gap in their reading abilities. This suggests that most students need special attention to develop better reading skills before utilizing Sipintar.

Table 3 shows the pre-test results, highlighting an urgent need for educational intervention through tools like Sipintar to improve students' reading abilities, particularly for those in the "Poor" and "Very Poor" categories. This intervention is expected to improve the distribution of reading skills across all categories, enabling more students to reach the "Good" or even "Excellent" categories in future evaluations.

In the next stage, a post-test was administered to the fourth-grade students, and the data obtained is displayed in Table 4.

Table 4. Descriptive Analysis Results of the Post-Test

No.	Descriptive Statistics	Post-test
1	Sample Size	72
2	Lowest Score	55
3	Highest Score	99
4	Total Score	6196.8
5	Average Score	86.07
6	Standard Deviation	8.86

Based on Table 4, the students' reading performance showed the lowest score of 55 and a highest score of 99. The average post-test score was 86.07, with a standard deviation of 8.86.

Tabel 5. Post-test Categories for Fourth-Grade Students

Score Range	Category	Post-test	
		Frequency	Percentage
80-100	Excellent	58	80.6%
70-79	Good	12	16.7%
60-69	Fair	1	1.4%
45-59	Poor	1	1.4%

<44	Satisfactory	0	0
	Total	72	100%

Based on the research results, Table 5 illustrates the students' reading abilities after utilizing Sipintar and taking the final test (post-test). The results show significant variation in abilities among the students. From the data obtained, 3 students, or 4.17%, were categorized as "Satisfactory," indicating students with relatively low abilities. On the other hand, 6 students, or 8.33%, fell into the "Poor" category, highlighting that their reading abilities need improvement to achieve more optimal results.

The largest group falls within the "Good" category, with 28 students or 38.89% placed in this category, indicating that most students have above-average reading abilities. Additionally, 14 students or 19.44% are in the "Fair" category, which does not require significant further improvement. Most notably, 21 students or 29.17% achieved the "Excellent" category, demonstrating that a significant portion had already developed very strong reading abilities before utilizing Sipintar.

Table 6 Categorization of Reading Results of Fourth-Grade Students

No	Score Interval	Frequency		Percentage		Category
		Pretest	**Posttest**	**Pretest**	**posttest**	
1	80-100	0	58	0.0%	80.6%	Excellent
2	70-79	0	12	0.0%	16.7%	Good
3	60-69	10	1	13.9%	1.4%	Fair
4	45-59	24	1	33.3%	1.4%	Poor
5	<44	38	0	52.8%	0.0%	Satisfactory

The researcher applied the N-gain test to assess the effectiveness of using Sipintar in improving students' reading abilities. This test is used to calculate the changes in students' reading results before and after implementing the learning method. In this study, the effectiveness of the Sipintar media can be observed from the improvement in students' reading outcomes.

The N-gain test is used to measure the difference between pre-test and post-test scores, then normalized to provide a more accurate depiction of improvement in learning outcomes. The higher the N-gain value obtained, the more effective the Sipintar media is in improving learning outcomes.

Table the N-gain calculation results for the fourth-grade class, which illustrate the impact of using Sipintar in enhancing students' reading abilities, are presented in Table 7. This table shows the differences in reading abilities before and after the implementation of learning using Sipintar and indicates the extent of the improvement that occurred due to using this medium.

Table 7. Modified Criteria for Interpreting Normalized Gain.

No.	Indeks N-Gains	Frequency	Category	Percentage
1	$0,70 \leq g \leq 1,00$	51	High	71%
2	$0,30 < g < 0,70$	20	Medium	28%
3	$0,00 < g < 0,30$	1	Low	1%
	Total	72		100%

Based on the analysis of the N-Gain table regarding the improvement in reading skills, the majority of students demonstrated significant improvement after utilizing Sipintar. A total of 71% of students fell into the high N-Gain category ($0.70 \leq g \leq 1.00$), indicating that using Sipintar was highly effective in enhancing their reading abilities. The comparison between Pre-Test and Post-Test scores showed a sharp increase, revealing that most students could understand better and apply reading skills.

28% of students fell into the medium N-Gain category ($0.30 < g \leq 0.70$), indicating a fairly good improvement in their reading abilities, although not as rapid as the high category. This suggests they benefited from using Sipintar but may require more time to progress significantly.

Only 1% of students fell into the low N-Gain category ($0.00 < g \leq 0.30$), indicating minimal improvement in reading ability. While a small portion of students still require special attention, these results demonstrate that using Sipintar has significantly improved the reading abilities of most students.

Overall, the use of Sipintar has been effective in improving students' reading abilities, with the majority experiencing significant improvement. Students in the high N-Gain category dominated the results, while some students in the medium category still require additional encouragement, and only a very small number of students need more focused attention to enhance their reading skills.

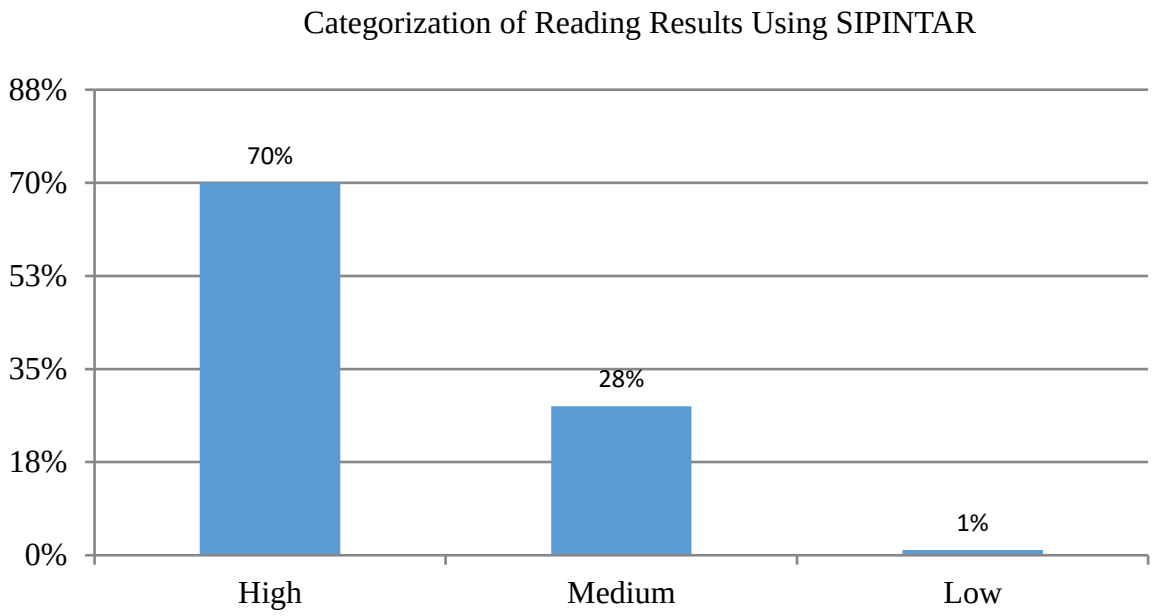

Chart 1. Categorization of Reading Results Using Sipintar

In Chart 1, the frequency distribution of the reading results of fourth-grade students, grouped based on the N-Gain Index, is clearly shown. This index is used to measure the effectiveness of improving reading ability after using the learning media. The data reveals that the majority of students, 71%, fall into the High category, with N-Gain values ranging between $0.70 \leq g \leq 1.00$. This indicates that most students achieved a very good improvement in their reading abilities after using the media.

Meanwhile, 28% of students fall into the medium category with N-Gain values between $0.30 < g < 0.70$, meaning that although they experienced improvement, their rate of growth was not as high as those in the High category. Additionally, 1% of the students are in the Low category with N-Gain values between $0.00 < g < 0.30$, indicating that only a few students showed minimal improvement in reading ability after using the media.

Chart 1 provides a strong depiction of the effectiveness of Sipintar in improving the reading abilities of fourth-grade students. The dominance of students in the High category suggests that the media has had a significant and sustained impact, helping students develop their reading skills substantially.

Table 8. Influence of Viewing Skills on N-Gain Categories

No	Viewing Skill Category	Number of Students	Average N-Gain
1	High	51	0.85
2	Moderate	20	0.55
3	Low	1	0.25
	Total	72	

Based on observations of 72 fifth-grade elementary students, it was found that students' viewing skills influenced the high post-test scores after using the Sipintar platform. Table 8 shows that students with high viewing skills, categorized as High N-Gain (71%), had an average post-test score improvement of 0.85. Students in the Moderate viewing skills category (28%) also showed improvement, though not as high as those with strong viewing skills, with an average N-Gain of 0.55. Meanwhile, students with low viewing skills (1%) experienced minimal improvement, with an average N-Gain of 0.25.

This data demonstrates a correlation between students' viewing skills and their post-test scores. Students with higher viewing skills could better understand the visual content and instructions in Sipintar, resulting in higher learning outcomes. These findings suggest that interaction with visual elements, such as videos, images, and illustrations, helped students with stronger viewing skills to connect the presented information with the concepts they were learning.

4. DISCUSSION

From a series of learning activities conducted in fourth-grade classes involving 72 students from four different schools in this study, the use of the Sipintar media has proven effective in increasing students' interest and motivation. This conclusion is based on structured surveys and classroom observations conducted with the participants. Specifically, surveys included questions regarding students' engagement and motivation during Sipintar sessions, using a Likert-scale survey developed based on established motivation indicators, such as engagement, enthusiasm, and persistence during learning sessions. Observations were also recorded to capture behavioral indicators of motivation, including participation in interactive activities and responsiveness to multimedia content.

Students' increased interest in reading instruction is attributed to the learning process that allows them to connect with one another, thereby fostering peer motivation. The increased interest in reading instruction may be partially attributed to peer interactions enabled by Sipintar, as indicated by student feedback. Further research could explore the direct causal relationship between interactive features of Sipintar and student motivation to determine the specific factors that contribute most effectively to engagement. This finding aligns with previous research showing that students value opportunities to interact with peers and gain learning experiences through interactive multimedia or MOOCs (Gamage et al., 2015; Maghfiroh et al., 2024; Thomas et al., 2024). Moreover, the increase in active student participation is driven by the interactive nature of the media (Camilleri & Camilleri, 2022). With the aid of this technology, all students actively engage in the learning process, ensuring

that no one falls behind in completing assigned tasks. This aligns with observational data indicating high levels of participation during Sipintar sessions, particularly among students in the high N-Gain category, suggesting a positive correlation between interactive features and active student engagement. Using Sipintar media has significantly increased students' motivation in the learning process. In line with findings from studies on MOOCs, motivation-based strategies, such as interactive learning, personalized content, and peer collaboration, are closely linked to increased student engagement and reduced dropout rates. For example, a systematic review conducted (Alj & Bouayad, 2024). Highlights the importance of interactive content and peer-to-peer collaboration in strengthening students' intrinsic motivation and improving the success of online courses. These skills support a more active, student-centered learning approach, aligning with teaching methods applied through MOOCs (Stutchbury et al., 2023).

Furthermore, the Sipintar media enables students to understand reading texts better through engaging interactive features, such as the use of audio-visual elements and digital-based learning activities. This approach aligns with the findings of Vosgerau et al. (2016) which indicate that digital technology, as implemented in MOOCs, supports academic literacy processes by enhancing interaction and dialogue between students and instructors. This technology allows students to learn more independently and collaboratively, ultimately helping them build a deeper understanding of texts. MOOCs offer openness in terms of learning resources and improve the quality and experience of reading comprehension through diverse resources and direct interaction with relevant content. In this regard, the MOOC approach allows students to adjust their learning pace and style while receiving faster and more in-depth feedback through interactive media, significantly improving their ability to understand reading texts. Additionally, MOOCs in learning have been proven to facilitate students in analyzing material more thoroughly (Lan, 2019).

After reviewing the research results that demonstrate the effectiveness of using Sipintar media, teachers should implement strategic follow-up actions to optimize these outcomes. The use of interactive media in teaching has been shown to enhance students' motivation and understanding (Herrera-Granda et al., 2024). Therefore, teachers can utilize interactive media like Sipintar to continuously stimulate students' interest and motivation in learning, particularly through more personalized and multimedia-based approaches. While the Sipintar media has proven effective in engaging students and increasing their motivation, certain limitations were noted in this study. Specifically, 28% of students were in the medium N-gain category, and 1%

in the low category. Research by Jano et al. (2018) suggests that combining Problem-Based Learning (PBL) with MOOCs could address this issue by fostering more active and creative participation, potentially enhancing learning outcomes. Future studies could apply this hybrid approach to maximize the motivational benefits of interactive media.

Additionally, the teacher-student interaction is crucial in improving students' reading and comprehension abilities through interactive classroom activities. Teachers should incorporate more activities that encourage interaction, such as group discussions, direct feedback, and audio-visual materials, to help students gain a deeper understanding and analysis of texts. In this way, teachers act as facilitators and active guides who promote students' direct involvement in the learning process, ensuring that learning outcomes are maximized (Nguyễn, 2022).

Despite the proven effectiveness of using Sipintar media in increasing students' interest and motivation, as well as its ability to help students better understand and analyze reading materials, certain limitations were identified in this study. Specifically, 28% of students fell into the medium N-gain category, and 1% into the low category. Research by Jano et al. (2018) shows that the integration of Problem-Based Learning (PBL) with Massive Open Online Courses (MOOCs) can enhance students' active and creative participation while facilitating deeper independent learning. Therefore, applying this combination has the potential to address these limitations and produce more optimal learning outcomes.

5. CONCLUSIONS

This study shows that using the Sipintar MOOC platform significantly improves the reading abilities of fourth-grade students in the research area District. Before the intervention, most students had a low reading ability level, with 52.8% falling into the "Very Poor" category. After the intervention using Sipintar, 71% of students showed significant improvement in reading ability and moved into the high N-Gain category. These results indicate that Sipintar can be an effective learning tool, particularly in areas with limited access to education, such as the research area District.

The use of the Sipintar platform is recommended for broader implementation in other regions facing similar challenges in educational access. This can help reduce the academic gap between urban and rural areas. Additionally, teachers should leverage this platform to design more interactive and personalized materials to continuously boost students' motivation in learning to read. Using audio-visual features and digital-based interactions available on Sipintar can make it easier for students to comprehend the material. Collaboration between

schools is also essential to share the best practices and experiences in using Sipintar, so that this innovation can be optimized for the benefit of national education.

This study has several limitations. Firstly, the sample size was limited to 72 students from a specific district, which may affect the generalizability of the findings to other regions. Additionally, the study was conducted over a short period, which may not fully capture the long-term effects of the Sipintar platform on reading skills. The study also did not include a control group, which limits the ability to attribute improvements solely to Sipintar.

The implications of this study include improving basic literacy in areas with limited access to education. Using digital technology like Sipintar can help bridge the educational gap in Indonesia. Moreover, implementing Sipintar could serve as a model for integrating digital learning technology at the primary education level, which can be incorporated into the national curriculum to enhance the quality of education. The government is expected to provide further support through policies that encourage the use of educational technology in elementary schools, particularly in remote areas, to achieve more inclusive and equitable educational goals. This study demonstrates that MOOC-based educational technology like Sipintar can significantly improve student learning outcomes, especially in reading skills.

Future research could expand the sample size and include various regions to enhance the generalizability of the findings. Additionally, incorporating a control group and extending the study period could provide more comprehensive data on the effectiveness of Sipintar. Further studies could also explore the integration of Sipintar with other instructional strategies, such as Problem-Based Learning (PBL), to determine if this combination enhances engagement and learning outcomes. Investigating the impact of Sipintar on different age groups or subjects beyond reading skills could offer valuable insights into its broader applicability in primary education.

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