

## Implementation of Technology-Based Learning Strategies through Digital Storytelling Applications of Elementary School Students

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### Abstract

This study explores the effectiveness of using the Steller application in improving students' reading interests. The research employed a quantitative experimental design with pre-test and post-test procedures involving the experimental group (using Steller) and the control group (using traditional lecture methods). This study involved 57 students from the 4th-grade classes of Thariq Bin Ziyad and Khalid bin Walid at SDI Ibnu Miskawaih. A sample was selected using the Simple Random Sampling method, with class 4 Khalid as the control group and class 4 Thariq as the experimental group. Data were collected through observation, documentation, questionnaires (pre-test and post-test), and interviews. Data analysis techniques included descriptive and inferential statistics, which involved normality testing, homogeneity testing, and hypothesis testing using an independent sample t-test. The results indicated that the average post-test score of the experimental group (76.21) was higher than that of the control group (72.76), with a significant difference in the t-test ( $p = 0.000$ ). Using digital storytelling applications improved students' reading interest and learning motivation. This study contributes to the development of technology-based literacy learning at the primary education level, especially in MI.

### Keywords

Digital Storytelling; Literacy; Reading Interest; Steller; Technology-Based Learning



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## INTRODUCTION

Reading interest is one of the key factors in literacy development and improving student learning outcomes, particularly at the elementary education level, such as in Madrasah Ibtidaiyah (MI). However, according to a UNESCO report, the reading interest of the Indonesian population, including students, remains very low, with an index of only 0.001, indicating that only one in a thousand people shows serious interest in reading. This condition directly impacts students' academic abilities, including concept understanding, critical thinking skills, and communication skills (Rosiana et al., 2024).

The low reading interest among MI students is influenced by several factors, including monotonous teaching methods, limited access to interesting reading materials, and the influence of the family and social environment (M. S. P. Susanti & Anggraini, 2023). Many teachers still rely on conventional teaching methods that are less motivating for students to read. In some areas, access to varied and engaging reading materials is also limited. The family environment, which does not support reading habits, along with the dominance of digital entertainment, exacerbates this situation (Nurtika, 2021).

The development of digital technology in the era of the Industrial Revolution 4.0 opens opportunities to improve this situation. When used appropriately, technology can enhance students' reading interest through more interactive and enjoyable learning approaches (Fadhillah & Khairani, 2024). One emerging innovation is digital storytelling, combining multimedia elements (images, sounds, and text) to deliver stories (Fortinasari et al., 2022). Applications like Steller allow students to create digital stories that not only engage them in reading but also in the creative process of story creation, which can enhance their literacy skills (Saraswati et al., 2024).

However, implementing technology in education, especially digital storytelling, in Islamic-based schools like MI is still not optimal. Most technology use is limited to simple material presentations without in-depth interaction or creative applications (Meliani et al., 2021). Therefore, using applications like Steller can be a solution to improve students' reading interests. By combining text, images, and videos, this application can help students become more interested and engaged in literacy activities (Ratih et al., 2024).

This study aims to explore the effectiveness of using digital storytelling applications, specifically Steller, to enhance the reading interest of MI students. The main focus of this research is to measure how much this technology can attract students' interest in reading activities and improve their literacy skills. Thus, the results of this study are expected to provide guidance for teachers and educational institutions in integrating technology into learning and provide solutions to the low reading interest faced by students at the elementary level. Reading interest is an important element in developing students' literacy, especially at the elementary education level (Fikri et al., 2022). Several factors can influence students' reading interests, including the family environment, school support, and teaching methods (N. T. Susanti & Widyana, 2022). In Indonesia, students' reading interest is still considered low, as reflected in the Programme for International Student Assessment (PISA) report, which shows that Indonesia ranks low in literacy skills, with low reading interest as the main cause (Suherdi, 2021).

Research by Purwanti (2023) shows that conventional teaching methods, such as lectures, often fail to attract students' reading interest and tend to be boring. Limited access to interesting reading materials, especially in remote areas, as well as the scarcity of reading materials relevant to the context of Islamic education in Madrasah Ibtidaiyah (MI), further exacerbates this condition. Additionally, teaching approaches that do not align with technological developments and students' needs worsen the situation. The family environment is also crucial in building children's reading habits. Parental support in providing books and fostering a reading culture at home significantly impacts students' reading interests (Rahman et al., 2020). Limited access to engaging reading materials, especially in schools without adequate library facilities, continues to be a major challenge in improving students' reading interests (Gifari et al., 2024). Therefore, technology-based solutions, as proposed by Brown and Green, can be an effective alternative to enhance reading interest by offering more interactive and dynamic learning experiences (Mahendra et al., 2024).

The use of technology in education has grown rapidly, offering students opportunities to learn through more interactive and engaging experiences. Technology-based learning can increase student engagement by integrating various media, such as videos, sounds, and graphics, which support a more effective understanding of the material (Resti et al., 2024). Research by Johnson (2025) shows that technology is more effective in improving student comprehension than traditional teaching methods, particularly in exploratory and collaborative learning. The application of

technology in literacy learning allows students to access a wider range of reading materials that align with their interests. For example, digital storytelling applications that utilize text, images, and audio can encourage students to engage more in learning and enhance their creativity and critical thinking skills (Kurniawan et al., 2025). This strategy is highly relevant for MI students who require more engaging learning methods that meet their needs in the digital era.

Digital storytelling is a teaching method that leverages technology to combine text, images, sound, and video in delivering stories (Apriliyana et al., 2023). Research by Nguyen et al. (2020) shows that digital storytelling provides a richer and more interactive learning experience, increasing student engagement in learning and strengthening their literacy skills, including reading and writing. By asking students to create stories based on their experiences or learning material, this method can also enhance students' critical and creative thinking skills (Cahyanti & Nuroh, 2023).

Research by Lee et al. (2023) reveals that using digital storytelling in the classroom can significantly increase students' reading interest. Higher student engagement in this activity results in improved learning motivation. Additionally, digital storytelling encourages active student participation in learning in a way that is engaging and easy to understand while enhancing their communication skills (Kim et al., 2024). Steller is one of the digital storytelling platforms that allows users to create digital stories with a combination of text, images, and videos. This application offers creative freedom for students to express their ideas through visual stories. Research by Lim (2024) shows that Steller effectively enhances students' reading interest, as the application is easy to use and engaging, supporting constructivist learning theories that emphasize the importance of meaningful learning experiences in building students' knowledge (Tobin et al., 2021).

Using digital applications such as Steller enhances students' literacy skills and communication and collaboration skills. This application encourages students to think logically, organize ideas, and present their thoughts in creative visual forms, skills that are essential in 21st-century education (Wang et al., 2022). Using Steller, students can develop digital skills relevant to the current era of digitalization (Rahmandika et al., 2024). The use of technology in learning significantly impacts increasing students' reading interest, especially in the context of literacy. Digital technology can enhance students' motivation to read by

creating engaging and interactive learning experiences, as seen in digital learning applications and e-books (Isnaini et al., 2024). Additionally, technology enables personalized learning, allowing students to learn at their own pace and according to their learning style, which in turn increases their reading interest.

Technology-based applications, such as digital storytelling, can also reduce barriers for students with low reading interest. These applications assist in understanding the material and provide space for students to express themselves creatively (Firgiawan et al., 2024). By incorporating multimedia elements, digital storytelling provides a more enjoyable and meaningful learning experience, ultimately increasing students' reading interest. According to a report by UNESCO, reading interest among students in Indonesia, particularly at the Madrasah Ibtidaiyah (MI) level, is relatively low. The reading interest index in Indonesia is only 0.001, meaning that only one in every thousand people shows serious interest in reading. This hurts students' learning outcomes, affecting their understanding of concepts, critical thinking skills, and verbal and communication abilities. This situation reflects a significant challenge in increasing reading interest, which is also influenced by factors such as monotonous teaching methods, limited availability of engaging reading materials, and the lack of family support for reading habits.

Furthermore, this research explores the effectiveness of implementing digital storytelling technology through applications like Steller in increasing reading interest among elementary school students (SD/MI). This study measures how digital storytelling technology can attract students to engage more actively in reading activities and enhance their literacy skills. Additionally, this research seeks to provide deeper insights into how technology can transform classroom dynamics and impact students' learning motivation. With this approach, it is expected to offer solutions to enhance student engagement in literacy activities and motivate them to read more.

On the other hand, previous research conducted over the last decade has shown various relevant findings. For instance, Fortinasari et al. (2022) found that digital storytelling can effectively improve reading interest, as this approach provides a more interactive and creative learning experience compared to traditional teaching methods. (Fadhillah & Khairani, 2024) added that using technology in learning can increase student interest and engagement, especially when applied correctly. Additionally, (Saraswati et al., 2024) revealed that by creating digital stories, students can develop their literacy skills in a more creative way relevant to everyday life. A study by (Sukmawati et al., 2022) also concluded that digital storytelling provides an enjoyable and interactive learning

experience, helping students better understand the subject matter through the use of visual and auditory elements.

## METHOD

This study uses a quantitative experimental design to test the cause-and-effect hypothesis between the independent variable (technology-based learning through digital storytelling applications) and the dependent variable (students' reading interest). This research was conducted in January 2025 at SDI Ibnu Miskawaih, at Jl. Mohnoh Nur No.112, Leuwimekar, Leuwiliang Sub-district, Bogor District, West Java 16640. The population in this study consists of 57 students from the 4th-grade classes of Thariq Bin Ziyad and Khalid Bin Walid at SDI Ibnu Miskawaih. The research sample was selected using the Simple Random Sampling technique, involving two classes: 4th grade Khalid as the control group and 4th-grade Thariq as the experimental group.

Data collection in this study was carried out using several methods: Observation, Questionnaire (Pre-test and Post-test), Documentation, and Interviews. Validity was tested using the Point Biserial technique. Of the 20 questionnaire statements that were piloted, all 20 questionnaires were deemed valid according to the provided table:

**Table 1.** Questionnaire Validity Test Results

Item	Rcount	Rtable	Results
1	0.447	0.279	Valid
2	0.428	0.279	Valid
3	0.426	0.279	Valid
4	0.412	0.279	Valid
5	0.444	0.279	Valid
6	0.434	0.279	Valid
7	0.447	0.279	Valid
8	0.458	0.279	Valid
9	0.426	0.279	Valid
10	0.352	0.279	Valid
11	0.387	0.279	Valid
12	0.327	0.279	Valid
13	0.319	0.279	Valid
14	0.371	0.279	Valid
15	0.323	0.279	Valid
16	0.374	0.279	Valid
17	0.316	0.279	Valid
18	0.331	0.279	Valid

<b>19</b>	0.420	0.279	Valid
<b>20</b>	0.541	0.279	Valid

Reliability was tested using Cronbach's Alpha, which showed a result of 0.718, greater than 0.700, meaning it is considered reliable (Ida & Musyarofah, 2021).

**Table 2.** Reliability Statistics

<b>Cronbach's Alpha</b>	<b>N of Items</b>
<b>0,718</b>	<b>20</b>

Based on the table above, the results of the Reliability Test for the learning instrument in this study are  $0.718 > 0.700$ , which means the instrument is reliable. The data in this study were collected through observation, documentation, surveys, and interviews. Observation was conducted to assess students' reading interest before and after the Digital Storytelling instruction. At the same time, documentation gathered visual evidence related to the research process and the number of students involved. The survey included pre-tests and post-tests to measure changes in students' reading interest, and interviews were conducted to gather information on factors affecting reading interest and the use of learning media.

Data collection techniques included surveys to measure changes in reading interest through pre-tests and post-tests and interviews to obtain qualitative data on issues related to reading interest and the use of instructional media. Data analysis used descriptive statistics to organize and analyze data from observations, interviews, and documentation. Inferential statistics included normality testing with Shapiro-Wilk to assess the data distribution, homogeneity testing with Levene to check for equal variances, and hypothesis testing using independent sample t-tests to compare the mean reading interest between the experimental and control groups. The research hypothesis includes the null hypothesis ( $H_0$ ), which states that there is no significant difference in reading interest between students who use Digital Storytelling instruction and those who do not, and the alternative hypothesis ( $H_a$ ), which states that there is a significant difference.

## **FINDINGS AND DISCUSSION**

### **Findings**

#### **Normality Test**

A normality test was conducted using the Shapiro-Wilk test on both the pre-test and post-test results for the control and experimental groups to evaluate the normal distribution of the data.

Based on the results of the Shapiro-Wilk test, the data in both groups showed a normal distribution with significance (Sig.) values greater than 0.05, as follows:

**Table 3.** Normality Test

	Class	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<b>Mark</b>	Control Class Pre-test	0.132	29	.200*	0.956	29	0.261
	Experiment Class Pre-test	0.117	28	.200*	0.967	28	0.496
	Control Class Post-test	0.159	29	0.060	0.951	29	0.200
	Experiment Class Post-test	0.131	28	.200*	0.954	28	0.248
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

Since all significance values are greater than 0.05, it can be concluded that the data in both groups are normally distributed.

### Homogeneity Test

Using Levene's Test, homogeneity was tested to assess the equality of variances between the experimental and control groups. Based on the results of the homogeneity test, the Sig. value for the Levene test based on the mean was 0.065, greater than 0.05. Therefore, the samples in both groups can be considered homogeneous, indicating that the variances between the two groups are not significantly different.

**Table 4.** Homogeneity Test

		Levene Statistic	df1	df2	Sig.
<b>Mark</b>	Based on Mean	3.540	1	55	<b>0.065</b>
	Based on Median	3.236	1	55	0.078
	Based on Median and with adjusted df	3.236	1	44.252	0.079
	Based on trimmed mean	3.443	1	55	0.069

Based on the table above, the Sig Based on Mean value for the pre-test in both the control and experimental groups is  $0.065 > 0.05$ , which indicates that the groups are homogeneous.

### Hypothesis Test

Hypothesis testing was conducted using an independent sample t-test to compare the post-test results between the experimental and control groups. Based on the results of the t-test, the Sig. (2-tailed) value was 0.000, which is less than 0.05. This indicates a significant difference between the



post-test results of the experimental group, which used the digital storytelling application, and the control group, which used the lecture method. Thus, the null hypothesis ( $H_0$ ) stating that there is no difference between the two groups can be rejected, and it can be concluded that learning using the digital storytelling application significantly impacts students' reading interest. The average post-test score in the control group was 72.76 with a standard deviation of 1.662, while in the experimental group, the average post-test score was 76.21 with a standard deviation of 1.618.

**Table 5.** Independent Sample t Test

		Levene's Test for Equality of Variances						95% Confidence Interval of the Difference			
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	Lower	Upper
						One-Sided p	Two-Sided p				
<b>Mark</b>	Equal variances assumed	0.023	0.880	-7.950	55	0.000	0.000	-3.456	0.435	-4.327	-2.585
	Equal variances not assumed			-7.954	54.995	0.000	0.000	-3.456	0.434	-4.326	-2.585

Based on the table above, the Sig. (2-tailed) value is  $0.000 < 0.05$ . Therefore, it can be concluded that the null hypothesis ( $H_0$ ) is rejected. This indicates a significant effect between digital storytelling learning and the lecture method. To see the mean post-test scores for both the control and experimental groups, refer to the statistical table below:

**Table 6.** Group Statistics

			Std. Deviation	Std. Error Mean
Class		N	Mean	
<b>Mark</b>	Control Class Post-test	29	72.76	1.662
	Experiment Class Post-test	28	76.21	1.618

## Discussion

Discussion is the most important part of writing a journal article. At this stage, the author must present the thesis and research findings systematically, scientifically, and factually. Explain the impact of research findings and their impact. Then, the writer must compare the results with

previous studies relevant to the topic of discussion. This study aims to evaluate the impact of implementing a technology-based learning strategy, specifically using the digital storytelling application (Steller), on improving students' reading interest at SDI Ibnu Miskawaih. Based on data analysis obtained from pre-test and post-test results, several findings can be concluded as follows:

The use of the digital storytelling application through Steller has proven to have a positive impact on improving students' reading interests. Although there was a slight decrease in the post-test scores of the experimental group compared to their pre-test scores, the average post-test score of the experimental group (76.21) was still higher than that of the control group (72.76). This indicates that using the Steller application significantly improved students' reading interests. The digital storytelling application allows students to create stories using text, images, sounds, and videos, which can increase students' engagement in literacy learning. With this application, students read the material and organize and recount the information they read in the form of a visual story. This process strengthens their understanding of the material and develops their critical thinking and creativity skills. This aligns with the research by Nguyen et al. (2020), which shows that the use of technology in the form of digital storytelling can create a more engaging and profound learning experience.

The digital storytelling application used in this study enhanced students' reading interest and positively affected their learning motivation. Learning motivation in this context refers to students' engagement, enthusiasm, and curiosity in following the learning process. The experimental group, which used the Steller application, showed a higher motivation level than the control group, which used traditional lecture methods. Technology-based learning methods, such as the Steller application, leverage more interactive visual and narrative approaches, making students feel more interested and engaged in learning. According to Brown and Green (2020), technology-based learning creates a more enjoyable learning experience and can increase students' motivation. The Steller application enables students to interact with the learning material through a combination of various digital media (images, sounds, and videos), making the learning process more engaging and motivating students to continue learning.

Moreover, the digital storytelling application also aligns with constructivist theory, emphasizing the importance of active and meaningful learning experiences. Through this application, students can build their knowledge more creatively and enjoyably, deepening their understanding of the material. The statistical test results indicate a significant difference between

the reading interest of students who used the digital storytelling application and those who used traditional lecture methods. The Sig. (2-tailed) value of 0.000 ( $p < 0.05$ ) shows that the use of the Steller application is more effective in increasing students' reading interest compared to the traditional lecture method, which is more passive.

Although there was a slight improvement between the pre-test (0.261) and post-test (0.200) scores in the control group, this change was not significant. In contrast, the experimental group using the digital storytelling application showed better results with higher pre-test scores (0.496) and a slight decrease in post-test scores to 0.248. Although there was a decrease in the post-test scores, the result was still better than that of the control group. The decrease in post-test scores in the experimental group may be caused by various external factors, such as limited time for using the application or other factors influencing the learning process. However, the significant difference suggests that the digital storytelling application has a stronger impact on improving students' reading interest.

This study contributes to literacy learning, particularly at the elementary school/MI level. The application of technology in the form of the digital storytelling application (Steller) has been proven to increase students' reading interest. The success of this application in enhancing reading interest demonstrates that technology when used appropriately, can be an effective tool to overcome challenges in traditional literacy learning. The implications of this study are highly relevant for educators and education policymakers. Integrating technology into the curriculum, especially at the elementary education level, can create a more engaging learning experience that aligns with the needs of the times. This allows students to develop their literacy skills more effectively and enjoyably.

In addition, the results of this study also open up opportunities to develop more innovative and creative learning strategies that can enhance students' reading interests. By utilizing engaging digital media, literacy learning can be conducted more relevant and enjoyable while supporting the development of students' critical thinking and creativity skills. As a next step, further research could be conducted to explore other factors that affect the effectiveness of using the digital storytelling application in literacy learning, such as the duration of application use, the interaction between students and the application and its impact on other literacy skills such as writing and speaking.

## CONCLUSION

This study demonstrates that the Digital Storytelling application (Steller) effectively enhances reading interest among elementary school students at SDI Ibnu Miskawaih. The application, which combines text, images, sounds, and videos, makes learning more engaging and interactive, leading to higher reading interest than traditional methods. Despite a slight decrease in the experimental group's post-test results, the comparison with the control group shows significant improvement. The study also highlights the positive impact of technology-based learning on student motivation, aligning with constructivist principles. This research contributes to the development of literacy learning by showing the effectiveness of digital storytelling in increasing students' reading interest at the elementary education level.

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