Enhancing elementary students' narrative writing skills through digital storytelling projects

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Abstract

This study examines the effectiveness of digital storytelling projects as a technology-integrated learning model to enhance narrative text writing skills among elementary students. Addressing the need for innovative approaches to writing instruction, the research employed a quasi-experimental design with a non-equivalent control group. A cluster random sampling method was applied to select 53 students from a larger population. Data were collected through pre-tests and post-tests based on established writing skill indicators, and analyzed using an independent sample t-test. Findings indicated that the digital storytelling project model had a positive impact on students' narrative writing performance. Additional outcomes included the development of brainstorming and critical thinking abilities to produce coherent storylines, an increase in vocabulary and refinement of writing style, and the provision of meaningful and engaging learning experiences. The study highlights the potential of digital storytelling as an effective pedagogical tool for improving both linguistic competence and creativity in writing instruction.

Keywords: Creativity; digital storytelling; narrative writing; primary education; writing skills

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1. INTRODUCTION

Writing activities are lifelong learning, so they require a complex and lengthy process because they involve writing, planning, designing, reviewing, and reassessing to contribute to the reader explaining ideas and putting together meaningful sentence forms. (Çetin & Cihan, 2021; Chanwaiwit & Inpin, 2021; Prabowo et al., 2025). Writing skills are critical for elementary school students to develop critical thinking skills, improve academic performance, and foster emotional growth. (Samosa et al., 2021; Yavuz et al., 2020). Research from (Mehmet & & Çifci, 2021) Reveals that writing skills are a complex psychological, physical, and emotional activity. Hence, writing activities are not only considered simply moving letters, words, and sentences into writing but require the ability to think systematically, creatively, critically, and physically competently using writing tools and expressing emotions.

Based on the problems found in the elementary school District Kotagede, writing skills are the most significant problem these schools face. This is because students have difficulty writing punctuation marks, conjunctions, and using capital letters, which affects other subjects. Then, students cannot present a coherent storyline in Indonesian language subjects, so it is still difficult to understand. Another factor faced is that teachers are still confused about using a suitable learning model to improve the writing skills of elementary school students. Based on these problems, researchers are interested in improving the writing skills of elementary school students by using a project-based learning model. This is because teachers have not effectively used project-based learning models to improve the writing skills of elementary school students. This researcher's opinion is strengthened by the results of research conducted by (Irmade et al., 2023), based on the results of their research in the form of bibliometrics by analyzing Scopus database sources using VOS-Viewer to analyze the extent to which research in Indonesia uses a project-based learning model from 2015 to 2021. This research reveals that project-based learning models are most often used in physics. Thus, it is attractive for researchers to research to improve the writing skills of elementary school students using a project-based learning model in Indonesian language subjects.

Project-based learning (PBL) is a learning model that involves students in learning activities in class to provide meaningful learning. (Bender, 2012; Mamadaliyev et al., 2022). The PjBL model makes students active in learning and helps them learn or master 21st-century skills. (Sefton et al., 2020; Zinkevičiūtė et al., 2020; Wahyudiati et al., 2022; Chimwayange, 2024). Using the PjBL model in writing skills activities trains students to improve their brainstorming. (Sudadi et al., 2021). This is in line with the results of research conducted by (Lazić et al., 2021) This revealed that writing skills activities can be supported using the PjBL model so that students can solve problems, express ideas, and create final results in the form of works/products. Thus, the final result expected by research using the PjBL model is to create a work that collaborates with technology as mastery of 21st-century skills (Zhuldyz et al., 2022). The use of technology in learning activities is an effective and innovative step in improving the quality of education. This can bring about changes in education in Indonesia. (Aidarbekova et al., 2021; Hasni et al., 2024; Zvonova et al., 2021). Effective technology collaboration uses digital storytelling (Shengjergji et al., 2024).

Digital storytelling is a learning method that is present amid technological developments by combining multimedia capabilities (text, audio, video, animation, and film) and traditional stories to make the learning process more enjoyable, increase activity, and collaboration. (Zarifsanaiey et al., 2022; Mansfield et al., 2024). In addition, digital storytelling combines four essential components: active involvement of students, providing in-depth learning, project-based learning, and technology. (Hava, 2021; Qi et al., 2025; Yang et al., 2025). Digital storytelling methods can be an essential and effective tool to support the development of language skills, such as listening, speaking, reading, and writing. (Ayten & Polater, 2021; Moradi & Chen, 2019). However, the main focus of researchers is that elementary school students can produce a digital story through writing skills activities. By creating digital stories using the digital storytelling method, students can train their writing skills because students are trained to choose ideas, compose stories, brainstorm, and train their emotions. (Bakar, 2019; Ohler, 2013).

1.1. Purpose of study

Thus, this research aims to investigate in more depth the use of the digital storytelling project model to improve the writing skills of elementary school students, namely, whether the use of the digital storytelling project model significantly improves the writing skills of elementary school students.

2. METHODS AND MATERIALS

2.1. Research design

This study employed a quantitative approach using a quasi-experimental research design to examine the effect of digital storytelling projects on elementary school students' writing skills. The intervention was implemented in Indonesian language subjects focusing on narrative text material.

A non-equivalent comparison group design was adopted (Creswell, 2015; Johnson & Christensen, 2008), consisting of an experimental group that received digital storytelling project instruction and a control group that received project-based learning without digital storytelling. Both groups were given pre-tests and post-tests to measure writing skills before and after the intervention.

Table 1 presents the structure of the research design.

Table 1

Research design: Non-equivalent comparison group

Group		Pre-test	Treatment	Post-test
E	P1	X1	P2	
K	P3	X2	P4	

Legend:

E = Experimental Group

K = Control Group

P1, P3 = Pre-test (before treatment)

P2, P4 = Post-test (after treatment)

X1 = Digital Storytelling Project Model

X2 = Project-Based Learning Model

2.2 Participants

The research population comprised 656 Grade IV elementary school students in Kotagede Subdistrict, Yogyakarta. Cluster random sampling was used because the population was large and organized into groups with homogeneous characteristics (Creswell, 2015).

The selection of the experimental and control groups was based on pre-test results. Pre-test data were first subjected to normality and homogeneity tests to ensure both groups came from the same data distribution and had similar characteristics. Once these conditions were met, the group with the slightly higher mean pre-test score was assigned as the experimental group from SD Muhammadiyah Kleco (26 students), and the other as the control group from SD Muhammadiyah Purbayan (27 students). Thus, the total sample size was 53 students.

2.3 Data collection instruments

The primary data collection instruments were pre-test and post-test writing assessments. These instruments measured students' writing skills in narrative text using assessment indicators adapted from Mulyanah (2021). The indicators are presented in Table 2.

Table 2

Writing skills assessment indicators

No.	Indicator	Component
1.	Match the title with the theme.	Students can create story titles based on the themes provided
2.	Spelling	Students can use the rules for writing letters, conjunctions, and marks to read properly.
3.	Cut it wrong	Students can use a variety of vocabulary to compose a sentence. nice
4.	Sentence Structure	Students can compose effective sentence structures adapted to excellent and correct Indonesian grammar.
5.	Story Content	Students can present a story that is coherent and easy to understand

The hypothesis test used in this research is an independent sample t-test to determine differences between two groups when using the digital storytelling project model treatment with project-based learning. The steps for applying learning activities using the digital storytelling project model, according to Bender (2012); Ohler (2013), In this research is explained in Table 3.

Table 3

Steps in the digital storytelling project model

No.	Indicator	Component
1.	Identifying Problems	The teacher asks questions to train students' problem-solving abilities from the text they have read previously.
2.	Create a design and project implementation schedule	The teacher conveys the project design in the form of creating a digital storytelling story from the written word that the students have created. The project activities were carried out over four meetings.
3.	Carrying out Research	Students read storybooks before writing stories.
4.	Preparing Work Prototypes	Students begin to create and compose exciting stories.
5.	Evaluating Products	Students improve the stories they have created according to the input and suggestions given by the teacher, followed by creating digital storytelling stories using Zoom software.
6.	Product Finalization and Publication	Students present the results of their digital storytelling work to their teachers and friends.

3. RESULTS

3.1. Normality and homogeneity test results

The first step in this research was to carry out normality and homogeneity tests to determine whether the data used could meet the prerequisite tests. The normality test results of the data obtained can be seen in Table 4.

Table 4

Normality test results

	Kolmogorov-Smirnov		
	Group	Statistic	df	Sig.
Pre-test	Experiment	,114	26	,200
	Control	,153	27	,104

In Table 4, the normality test uses Kolmogorov-Smirnov because the sample in this study was 53 class IV students, so they obtained a significance value. In the experimental group, 0.002, while in the control group, 0.104. Thus, the data has a significant value. > 0.05, then it can be said to be distributed normally. Then, proceed with the homogeneity test described in Table 5.

Table 5

Homogeneity test results

Levene's Test of Equality of Error Variances			
F	df1	df2	Say.
2,082	1	51	,155

Based on the table of homogeneity test results using Levene's Test of Equality of Error Variances, the sig value is obtained. 0.155 > 0.05. Thus, the experimental and control groups have homogeneous data variances. After the prerequisite tests are met, the researcher can proceed to the hypothesis testing stage to answer the research questions.

3.2 Hypothesis test results

The next step is to test the hypothesis using the independent t-test. This test compares using the digital storytelling project model to improve students' writing skills with a comparison group. The statistical test results obtained can be seen in Table 6.

Table 6

Independent test results sample t-Test

		Levene's Test Equality of Error Variances		t-test for Equality of Means						
		F	Say.	t	df	Say. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test	Equal variances assumed	2,001	,163	3,991	51	,000	11,692	2,930	5,811	17,574
	Equal variances not assumed.			4,018	46,605	,000	11,692	2,910	5,836	17,548

Independent test results sample the t-test in Table 6, which can be seen in Levene's Test Equality of Error Variances section, obtained a sig value. 0.163 > 0.05, so it can be said that the data variance between the experimental and control groups is homogeneous. Thus, you can continue by looking at the t-test for Equality of Means to obtain a Sig value. (2-tailed) 0.000 < 0.05, so you can interpret that H0 is rejected, and Ha is accepted. This means a significant difference exists between the experimental group that used a digital storytelling project and the control group that used project-based learning. The conclusion that can be drawn is that the digital storytelling project model influences the improvement of the writing skills of fourth-grade elementary school students.

4. DISCUSSION

The results of this study demonstrate that the digital storytelling project model significantly improves the writing skills of fourth-grade elementary school students. The findings are consistent with both theoretical perspectives (Bender, 2012; Ohler, 2013) and empirical evidence from prior studies, which emphasize that digital storytelling not only enhances writing proficiency but also supports creativity, self-expression, and meaningful engagement in the learning process.

The first key finding indicates that the digital storytelling project model fosters creative thinking and the ability to produce coherent storylines. This aligns with Bender (2012) and Ohler (2013), who argue that digital storytelling encourages brainstorming, enhances learning experiences, and develops language communication

skills. Similarly, Kuo-Ping et al. (2018) and Sudadi et al. (2021) found that engaging students in a step-by-step process of idea exploration and organization significantly improves their ability to construct cohesive narratives. In the present study, the six-step model, including problem identification, design, research, evaluation, revision, and presentation, enabled students to systematically develop their ideas, leading to higher-quality written work.

The second major finding highlights improvements in vocabulary use and writing style. This result is supported by Wardani et al. (2020), who reported that digital storytelling increases students' vocabulary range and sentence production. Likewise, Girmen et al. (2019) observed that creating digital stories can refine writing style, particularly in spelling, punctuation, and logical paragraph connections. In this study, iterative feedback and revision phases helped students address such issues, contributing to more polished and technically accurate writing.

The third finding suggests that the digital storytelling project model provides meaningful learning experiences by integrating educational content with engaging activities. This is consistent with Arjaya et al. (2023), who noted that embedding educational messages within creative storytelling enhances enjoyment and motivation. Sarosa (2017) similarly found that the model promotes active, student-driven learning. Furthermore, Tsai et al. (2015) described how digital storytelling positions students as "directors" of their own learning, fostering autonomy and deeper engagement. In the current study, students demonstrated high participation levels, enthusiasm for sharing their work, and improved digital literacy, outcomes that suggest the model's capacity to cultivate both academic and 21st-century skills.

The convergence of the present findings with previous research underscores the potential of the digital storytelling project model as a technology-integrated, student-centered approach to language learning. By combining narrative construction with digital tools, the model simultaneously supports multiple literacy skills, listening, speaking, reading, and writing, while fostering creativity, collaboration, and self-directed learning. These qualities are essential for developing lifelong learning competencies in the 21st century.

5. CONCLUSION

The findings of this study indicate that the digital storytelling project model exerts a significant positive effect on the writing skills of grade IV students. Analysis using the independent samples t-test showed that the Sig. (2-tailed) value in the Equality of Means section was 0.000, which is less than 0.05. This result leads to the rejection of the null hypothesis (H0) and acceptance of the alternative hypothesis (Ha).

The application of the digital storytelling project model was found to train brainstorming abilities and enhance creative thinking skills, enabling students to produce coherent and structured storylines. In addition, the model contributed to vocabulary expansion and improvement in writing style, resulting in more refined and expressive written output. Furthermore, the approach provided meaningful learning experiences, fostering deeper engagement with the writing process.

Future research is recommended to broaden the scope of evaluation by incorporating all four language skills, thereby enabling a more comprehensive assessment of the effectiveness of the digital storytelling project model.

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