

## Analysis of Elementary School Students' Literacy Skills through Short Stories using the Project-Based Learning Model

P-ISSN: 2089-4341 | E-ISSN: 2655-9633

<https://jurnal.uia.ac.id/akademika/article/4531>

<https://doi.org/10.34005/akademika.v14i01.4531>

Received: **February 23, 2025**

Reviewed: **May 23, 2025**

Published: **June 20, 2025**

**Siti Nurhayati**

University of Pamulang, South Tangerang, Indonesia

Correspondency: [dosen02842@unpam.ac.id](mailto:dosen02842@unpam.ac.id)

**Abstract:** *This study aims to analyze the improvement of elementary school students' literacy skills by implementing a short story-based Project-Based Learning (PjBL) model. Specific objectives include: (1) evaluating the improvement in students' reading and writing skills after the implementation of PjBL; (2) identifying factors that support and hinder the implementation of this model; and (3) providing implementable recommendations for teachers and education practitioners in literacy learning. This study uses a mixed-methods approach with a sequential explanatory design. The quantitative stage was conducted through a quasi-experimental design (pretest-posttest). In contrast, the qualitative stage was conducted through project narrative analysis and semi-structured interviews, which were processed using NVivo software. The research subjects were 28 fifth-grade students at Maskanul Qur'an Elementary School. Data collection instruments included literacy tests and interview guidelines. Statistical analysis used JAMOV1 for normality tests, paired sample t-tests, and N-Gain, as well as MINISTEP (Rasch model) for instrument validation. The results showed a significant improvement in students' literacy skills, with a t-value of -37.8 and  $p < 0.001$  and an average N-Gain score of 0.457. Qualitative analysis revealed that emotional engagement, collaboration within groups, and the relevance of the story content were the main supporting factors, while time constraints and initial ability were the main challenges. It can be concluded that short story-based PjBL is effective in improving literacy while developing 21st-century skills. These findings have important implications for the development of context-based literacy curricula and encourage the integration of PjBL as a transformative learning strategy at the elementary school level.*

**Keywords:** elementary school, project-based learning, short stories, student literacy

## INTRODUCTION

Literacy skills are the main foundation in the learning process, especially at the elementary school level. Literacy encompasses not only the ability to read and write, but also comprehension, analysis, and interpretation of information. In Indonesia, the literacy level of elementary school students remains concerning. According to data from the Programme for International Student Assessment (PISA) in 2022, Indonesia ranked 74th out of 79 countries in terms of student reading proficiency (OECD, 2023a, 2023b). This indicates that many students have not achieved adequate



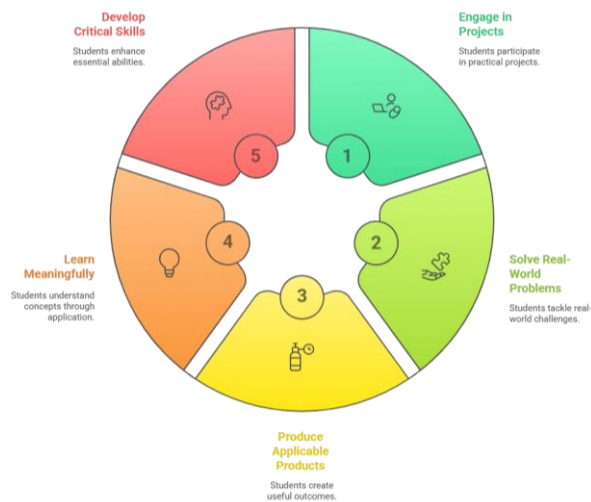
Akademika: Jurnal Teknologi Pendidikan is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

literacy competencies to support the learning process. Factors such as limited access to quality reading materials, lack of varied teaching methods, and minimal student involvement in literacy activities are the main causes of low literacy levels. Therefore, innovative and contextual learning approaches are needed to improve students' literacy skills from an early age.

Empirical studies show that many elementary school students have difficulty understanding reading texts, especially those related to short stories. Research conducted by Misriandi & Hendrawan, (2024) found that students experienced a significant increase in vocabulary mastery after engaging in short story reading activities. However, before the intervention, many students had limitations in understanding the meaning of words and the context of the story. This data indicates that without an appropriate learning approach, students' literacy skills remain low. Additionally, observations in several elementary schools reveal that literacy activities are often monotonous and uninteresting to students, leading to a lack of motivation to read and write. This situation calls for more effective and engaging learning strategies to enhance student participation in literacy activities.

Initial observations conducted in several elementary schools indicate that students are more interested in activities involving short stories than other informative texts. Short stories that contain local elements and are relevant to students' daily lives can increase students' interest in reading. However, conventional methods of delivering material prevent this potential from being optimally utilized. Teachers tend to use lecture methods without actively involving students in the learning process. As a result, students become passive and less motivated to explore the content of the stories in depth. These observations are consistent with the findings of a study by Rohim & Rahmawati, (2020) which emphasizes the importance of an active learning approach to improve reading literacy. Therefore, a learning model that integrates short stories into activities that involve students directly and actively is needed.

One approach that is considered effective for improving student literacy is the Project-Based Learning (PjBL) model. This model emphasizes project-based learning that involves students in real and contextual activities. In the context of literacy, PjBL can be applied by asking students to create projects based on short stories that they read, such as making illustrations, plays, or rewriting stories from different perspectives. Research by Nurhadiyah et al., (2020) shows that the implementation of PjBL in Indonesian language learning in elementary schools can significantly improve student learning outcomes. This model also encourages students to think critically, collaborate, and develop their creativity. Thus, PjBL is a potential solution for improving students' literacy skills through active involvement in the learning process.



**Figure 1.** Project-Based Learning Cycle

Recent research indicates that integrating short stories and the PjBL model in learning can have a positive impact on improving students' literacy. A study by Ayu et al., (2025) found that students involved in short story-based projects showed significant improvements in speaking skills and reading comprehension. Additionally, research by Adnan et al., (2023) developed a PjBL-based project guide for short story learning, demonstrating that this approach is effective in improving students' writing skills. However, there is still limited research specifically examining the implementation of PjBL based on short stories at the elementary school level. Therefore, this study aims to address this gap by exploring the effectiveness of the PjBL model in enhancing elementary school students' literacy through short stories.

The novelty of this study lies in the integration of short stories and the PjBL model in the context of literacy learning in elementary schools. Unlike previous studies that focused more on cognitive aspects or general learning outcomes, this study emphasizes the learning process that actively involves students in short story-based projects. In addition, this study also considers the local context and culture of students in the selection of short stories, making them more relevant and interesting for students. With this approach, it is hoped that students will not only improve their literacy skills but also develop social skills, creativity, and cultural understanding. This study also contributes to the development of innovative and contextual learning models to enhance literacy at the elementary school level.

The main objective of this study is to analyze the effectiveness of a short story-based Project-Based Learning model in improving the literacy skills of elementary school students. Specifically, this study aims to: (1) evaluate improvements in students' reading and writing skills after implementing the short story-based PjBL model; (2) identify factors that support and hinder the implementation of this model; and (3) provide recommendations for teachers and education practitioners regarding the

implementation of PjBL in literacy learning. By achieving these objectives, it is hoped that this study can make a real contribution to efforts to improve literacy at the elementary school level.

This study is expected to provide both theoretical and practical benefits. Theoretically, this study enriches the study of the integration of the PjBL model and short stories in literacy learning in elementary schools. Practically, the results of this study can be used as a reference for teachers in designing and implementing innovative and contextual learning to improve student literacy. Additionally, this study can serve as a foundation for policymakers in formulating strategies and programs to improve literacy at the national level. Thus, this research contributes to efforts to enhance the quality of education in Indonesia, particularly in the area of literacy.

Based on the background, objectives, and benefits described above, the research questions in this study are: (1) How is the short story-based Project-Based Learning model applied in literacy learning in elementary schools? (2) To what extent is this model effective in improving students' literacy skills? (3) What are the factors that support and hinder the application of this model in the context of elementary school learning?

## **METHOD**

### **Types and Approaches to Research**

This type of research is mixed-methods research with a Sequential Explanatory Design approach, which is a two-stage design that begins with the collection and analysis of quantitative data, followed by qualitative exploration to deepen understanding of the quantitative results obtained. This approach was chosen because it aligns with the main objective of the study, which is not only to measure the effectiveness of the implementation of a short story-based Project-Based Learning model on improving the literacy skills of elementary school students but also to analyze in depth the students' responses to their learning experiences. Quantitative data was collected through pre- and post-tests to measure changes in students' literacy scores, while qualitative data was obtained through analysis of students' written project results and semi-structured interviews that explored students' perceptions, reading strategies, and reflections on understanding and constructing meaning from the short stories they studied. Thus, this approach not only provides objective numerical data but also enriches the interpretation of findings through an understanding of the context, nuances of the learning experience, and students' thinking processes in a holistic manner. The selection of mixed-methods with a sequential explanatory design also enables researchers to answer research questions comprehensively, creating integration between the pedagogical effectiveness of the PjBL model and students' functional literacy aspects in a contextual and authentic narrative context, thereby making it relevant for addressing literacy education challenges in the New Curriculum era.

## Research Design

This research design follows the Sequential Explanatory Design approach, in which the research process is divided into two main stages that complement each other. In the first stage, quantitative data collection and analysis were conducted through a one-group pretest-posttest design, which aimed to determine the effectiveness of short story-based Project-Based Learning on the literacy skills of elementary school students. The pretest is conducted before the intervention to obtain baseline data on literacy skills, and the posttest is conducted after the entire project-based learning process is completed. In the second stage, the research continues with a descriptive-exploratory qualitative approach, which aims to explore in greater depth the thinking processes, perceptions, and strategies of students during the learning process through the analysis of project narratives and semi-structured interviews. The integration of these two stages aims to produce a more comprehensive understanding—that is, not only knowing the extent of the impact of the learning intervention on literacy scores, but also how and why these changes occurred based on students' experiences and reflections. With this design, researchers can construct conclusions that are not only based on statistical data but also supported by contextual meanings obtained from in-depth qualitative data.

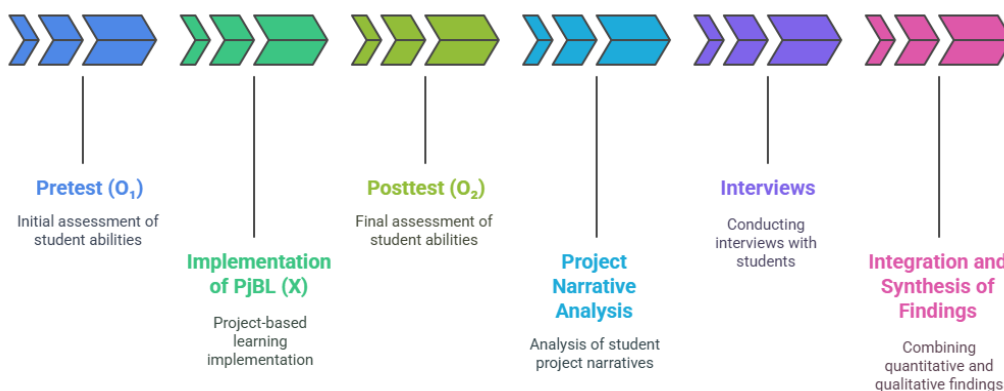
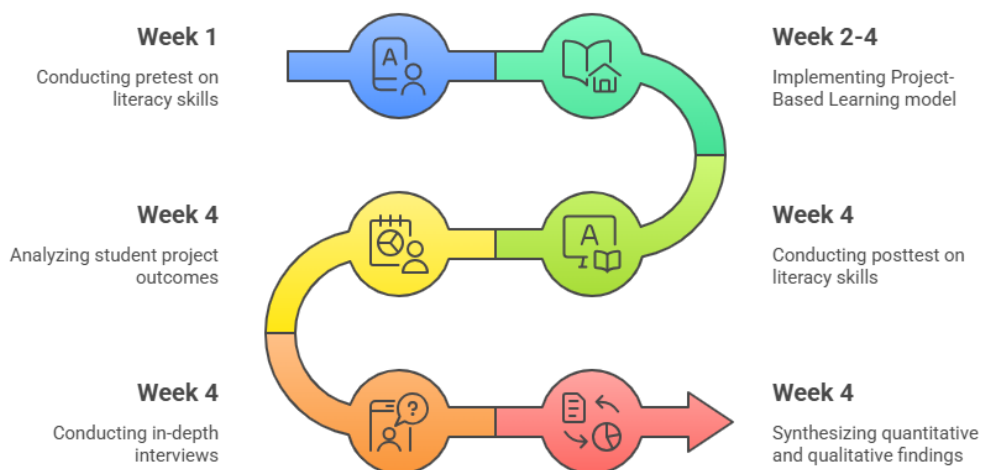


Figure 2. Educational Research Process

## Research Procedures

This study was conducted in two main stages. The first stage was quantitative data collection, which began with a pretest, followed by implementing a short story-based Project-Based Learning model over several meetings, and ended with a posttest to measure changes in students' literacy skills. The second stage involved qualitative data collection by analyzing students' literacy project outcomes and semi-structured interviews with selected students. The results from both stages were then analyzed separately and synthesized to provide a comprehensive understanding of the impact and dynamics of the implementation of the learning model on elementary school students' literacy skills.



**Figure 3.** Research Procedure

## Participants

The subjects of this study were fifth-grade students at Maskanul Qur'an Elementary School who were selected purposively. The selection of 28 quantitative participants was based on specific criteria, namely (1) students had intermediate literacy skills based on their previous semester report card scores and initial teacher assessments, and (2) classroom teachers were willing to actively participate in the implementation of the short story-based Project-Based Learning model in accordance with the learning intervention design. In the second stage, qualitative exploration, six students were selected as informants for interviews and project narrative analysis. Selection was conducted using stratification based on posttest results to represent the spectrum of students' literacy abilities: two students with high scores, two students with moderate scores, and two students with low scores. This technique was intended to obtain a comprehensive and balanced picture of students' responses and learning experiences from various achievement levels. This strategy allowed the researchers to identify patterns of differences in text interpretation and involvement in the learning process, so that the results of the qualitative exploration could enrich the understanding of the quantitative findings obtained previously.

## Data Collection Techniques and Procedures

The data collection technique in this study used an instrument triangulation approach to obtain valid and comprehensive data in accordance with the research objectives. Quantitative data were collected through literacy tests administered before and after the treatment, while qualitative data were obtained through analysis of student project results and semi-structured interviews. All data collection procedures were designed to represent the cognitive and affective dimensions of students' literacy comprehensively, both in numerical and narrative forms. In detail,

the data collection techniques and procedures used in this study are presented in Table 1 below.

**Table 1.** Data Collection Techniques and Procedures

Data Types	Collection Techniques	Time of Implementation
Quantitative data	Pretest-posttest literacy test	Before & after treatment
Qualitative data	Analysis of student narratives and semi-structured interviews	After the post-test

## Instruments

The data collection instruments in this study were developed based on literacy indicators relevant to the context of short stories and the Project-Based Learning model. The complete details of the instruments used are presented in Table 2 below.

**Table 2.** Literacy Test Instruments

Literacy Indicators	Specific Description	Context of the Question	Cognitive Domain
Identifying main ideas	Finding the main idea in a short story	Local narrative paragraphs (fables, legends)	C1-C2
Interpreting the meaning of words	Interpreting connotative/denotative meanings	Descriptive story	C2-C3
Summarizing the content of a text	Draw conclusions based on the structure of the text	Children's stories with simple characters and conflicts	C3-C4
Writing story responses	Writing opinions about moral values in stories	Stories with local cultural characters	C4-C5
Rewriting stories	Rewrite the story from a different perspective	Final project assignment	C5-C6

## Data Analysis Techniques

The data analysis techniques in this study include complementary quantitative and qualitative approaches, tailored to a sequential explanatory design. Details of the analysis steps are presented in Table 3 below.

**Table 3.** Data Analysis Techniques

Types of Analysis	Analysis Steps	Objectives
Quantitative Analysis	- Normality test (Shapiro-Wilk)	Ensuring normal data distribution before inferential testing
	- Hypothesis test (Paired Sample t-Test)	Testing the significance of differences between pretest and posttest scores
	- Score Gain Calculation	Knowing the level of improvement in students' literacy skills descriptively

Types of Analysis	Analysis Steps	Objectives
<b>Qualitative Analysis</b>	- Size Effect Calculation (Cohen'sd)	Measuring the extent of the influence of the PjBL model on student literacy
	- Data reduction (open coding of student narratives)	Identifying units of meaning from student literacy project results
	- Identify patterns of meaning	Develop initial themes based on student narratives and interviews.
	- Thematic categorization	Develop themes and sub-themes based on the depth and uniqueness of student responses.
<b>Data Integration (Mixing Process)</b>	- Data Triangulation	Compare project narratives, test results, and interviews for cross-validation.
	- Meta-inferential interpretation: combining quantitative and qualitative findings	Draw comprehensive conclusions regarding the effectiveness of PjBL in improving student literacy.

## RESULTS

### Descriptive Statistics of Pretest and Posttest

Descriptive statistics were used to see an initial overview of students' literacy skills before and after implementing the Project-Based Learning model, as shown in Table 4 below.

**Table 4.** Pretest and Posttest Results

	N	Mean	Median	SD	Min.	Max.
Identifying Main Ideas (Pretest)	28	59.6	59.0	3.28	54	66
Interpreting Word Meaning (Pretest)	28	57.8	57.5	3.26	52	65
Summarizing Text Content (Pretest)	28	61.6	61.5	3.65	52	67
Writing a Response to the Story (Pretest)	28	59.3	59.0	2.70	53	66
Rewriting the Story (Pretest)	28	56.9	57.0	3.74	51	65
Identifying Main Ideas (Posttest)	28	79.2	80.0	3.30	73	85
Interpreting Word Meaning (Posttest)	28	76.1	76.0	3.18	71	86
Summarizing Text Content (Posttest)	28	81.1	82.0	4.12	74	94
Writing a Response to the Story (Posttest)	28	77.4	77.5	3.37	70	85
Rewriting the Story (Posttest)	28	74.8	74.5	4.09	64	83

The results of the descriptive analysis in Table 4 show a significant increase in all indicators of students' literacy skills after implementing the short story-based Project-Based Learning model. The average pretest scores ranged from 56.9 to 61.6, with the highest score on the Summarizing Text Content indicator (M = 61.6) and the lowest on Rewriting the Story (M = 56.9). After the intervention, all indicators showed an average increase of more than 15 points, with the highest posttest score recorded on the Summarizing Text Content indicator (M = 81.1) and the lowest remaining on Rewriting the Story (M = 74.8). This improvement was also indicated by a shift in the median score from the range of 57–61 (pretest) to 74–82 (posttest). Data dispersion (standard deviation) remained stable and low, indicating that improvements occurred evenly

across all students. These results confirm that the consistent implementation of PjBL not only promotes improvements in learning outcomes but also strengthens students' narrative literacy skills comprehensively and distributively.

### Normality Test (Shapiro–Wilk)

Data normality was tested using the Shapiro–Wilk method to ensure that the data distribution met parametric assumptions. The results of the normality test are presented in Table 5 below.

**Table 5.** Normality Test (Shapiro-Wilk)

		<b>W</b>	<b>p</b>
<b>Pretest</b>	<b>- Posttest</b>	0.949	0.182

Note. A low p-value suggests a violation of the assumption of normality

The results of the Shapiro–Wilk normality test in Table 5 of the posttest data produced a value of  $W = 0.949$  and  $p = 0.182$ . Because the p-value is greater than the significance threshold of 0.05, it can be concluded that the posttest data is normally distributed. This means that the data meet the basic assumptions for proceeding to parametric statistical analysis, such as the Paired Sample t-Test. This condition is important to ensure the validity of the statistical inferences used to test the effectiveness of short story-based Project-Based Learning in improving students' literacy skills. Methodologically, these results strengthen the validity of the statistical model used, so that it can be believed that changes in students' literacy scores before and after the treatment can be analyzed accurately using parametric methods. These findings also support one of the main pillars of the sequential explanatory approach, namely strengthening the quantitative aspect with valid distribution before proceeding to qualitative exploration. Thus, these normality results provide a strong foundation for proceeding to the next stage of testing the effectiveness of the learning model against the literacy indicators established in the study.

### Paired Sample t-Test

To determine the significance of the difference in students' literacy skills before and after treatment, a Paired Sample t-Test was conducted. The results of the test are presented in Table 6 below.

**Table 6.** Results of Paired Sample t-Test

		<b>statistic</b>	<b>df</b>	<b>p</b>	
<b>Pretest</b>	<b>Posttest</b>	<b>Student's t</b>	-37.8	27.0	<.001

Note.  $H_a \mu_{\text{Measure 1}} - \mu_{\text{Measure 2}} \neq 0$

The results of Table 6, which shows the paired sample t-test between pretest and posttest scores, indicate a t-value of -37.8 with a degree of freedom (df = 27) and a significance level of  $p < 0.001$ . The p-value far below the significance threshold of 0.05 indicates that there is a highly statistically significant difference between students' literacy skills before and after the implementation of the short story-based Project-Based Learning model. The negative direction of the t-value indicates that posttest scores are consistently higher than pretest scores. These findings provide strong empirical evidence that the systematic and contextual use of PjBL can significantly improve elementary school students' literacy skills. Substantially, this proves that students' active involvement in story-based projects not only strengthens their understanding of text content but also encourages them to develop their ability to interpret, respond to, and recreate narratives more reflectively. These results align with the research objectives, which were to analyze the effectiveness of the project-based learning model on students' literacy in the integrated cognitive and affective dimensions. Thus, the implementation of story-based PjBL has proven to significantly improve the quality of narrative literacy among elementary school students.

### Size and Gain Effects Score

To determine the strength of the learning model's influence on improving student literacy, gain scores and effect sizes were calculated. The details of the calculations are presented in Table 7 below.

**Table 7.** N-Gain Test Results

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
N-Gain	28	.32	.55	.4572	.05134
Valid N (listwise)	28				

The results of the N-Gain test in Table 7 show that the average gain score (Mean = 0.4572) is in the moderate category based on Hake's classification ( $0.3 \leq g < 0.7$ ). The minimum gain value recorded was 0.32, and the maximum was 0.55, with a standard deviation of 0.05134, indicating that improvements in students' literacy skills occurred consistently and evenly across all participants. This reinforces previous findings that the short story-based Project-Based Learning model not only has a statistically significant effect but also a substantial pedagogical impact in promoting student literacy growth. The stable gain category at the intermediate level indicates that the improvement process is not merely the result of a momentary intervention, but rather reflects the active involvement of students in constructing meaning from the text, responding critically to the story's content, and creatively reproducing the narrative. Thus, these gains confirm that the structured and narrative-based implementation of PjBL can bridge the gap between students' initial literacy abilities and their maximum potential. These findings also realize

the main objective of the study: to analyze the effectiveness and depth of the influence of the PjBL model on five indicators of elementary school students' literacy in the context of meaningful and sustainable learning.

### Validity and Reliability of Instruments

To ensure the instrument's suitability in measuring students' literacy skills, validity and reliability analyses were conducted using the Rasch Model approach. The results of the item validity analysis are presented in Table 8, while the results of the item and respondent reliability are presented in Table 9 below.

**Table 8.** Item Validity Analysis Results

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	JMLE MEASURE	MODEL S.E.	INFIT		OUTFIT		PTMEASUR-CORR.	AL-EXP.	EXACT OBS%	MATCH EXP%	ITEM	
					MNSQ	ZSTD	MNSQ	ZSTD						
10	2094	28	-.66	.06	1.59	1.83	1.59	1.84	A	-.04	.22	17.9	14.1	Rewriting the Story (Posttest)
5	1594	28	1.12	.06	1.24	1.03	1.23	1.01	B	.31	.21	21.4	11.1	Rewriting the Story (Pretest)
3	1724	28	.66	.06	1.23	.92	1.23	.89	C	.30	.21	10.7	13.7	Summarizing Text Content (Pretest)
1	1669	28	.86	.06	.98	.00	.98	.01	D	.18	.22	14.3	13.2	Identifying Main Ideas (Pretest)
8	2272	28	-1.20	.05	.97	.05	.92	-.11	E	.40	.25	14.3	12.6	Summarizing Text Content (Posttest)
9	2166	28	-.89	.06	.94	-.15	.94	-.15	e	.17	.23	10.7	9.2	Writing a Response to the Story (Posttest)
2	1618	28	1.04	.06	.89	-.42	.88	-.43	d	.33	.22	10.7	11.6	Interpreting Word Meaning (Pretest)
7	2131	28	-.78	.06	.84	-.53	.84	-.54	c	.23	.22	28.6	11.6	Interpreting Word Meaning (Posttest)
6	2218	28	-1.05	.06	.83	-.50	.83	-.50	b	.29	.23	10.7	12.0	Identifying Main Ideas (Posttest)
4	1659	28	.90	.06	.72	-1.16	.72	-1.15	a	.04	.22	21.4	13.2	Writing a Response to the Story (Pretest)
MEAN	1914.5	28.0	.00	.06	1.02	.11	1.02	.09				16.1	12.2	
P.SD	267.3	.0	.93	.00	.25	.85	.25	.85				5.8	1.4	

The results of item validity analysis using the Rasch Model in Table 8 show that all items are within the infit and outfit MNSQ range of 0.72 to 1.59, which is still acceptable based on the ideal tolerance limit of  $0.6 \leq \text{MNSQ} \leq 1.4$ . Although the item “Rewriting the Story (Posttest)” showed the highest infit and outfit MNSQ values of 1.59, this value is still within the upper tolerance threshold and does not indicate serious misfit. Other items showed relatively stable MNSQ values close to 1.00, indicating that students' responses to each item align with the Rasch predictive model. Additionally, the ZSTD values range from -1.16 to +1.84, indicating that no items are extreme in terms of misfit. These findings indicate that the instrument used to measure students' literacy skills—both in the pretest and posttest—has strong construct validity. Thus, all items can be considered suitable for measuring literacy indicators in the context of implementing short story-based Project-Based Learning in elementary schools.

**Table 9.** Item Reliability Results

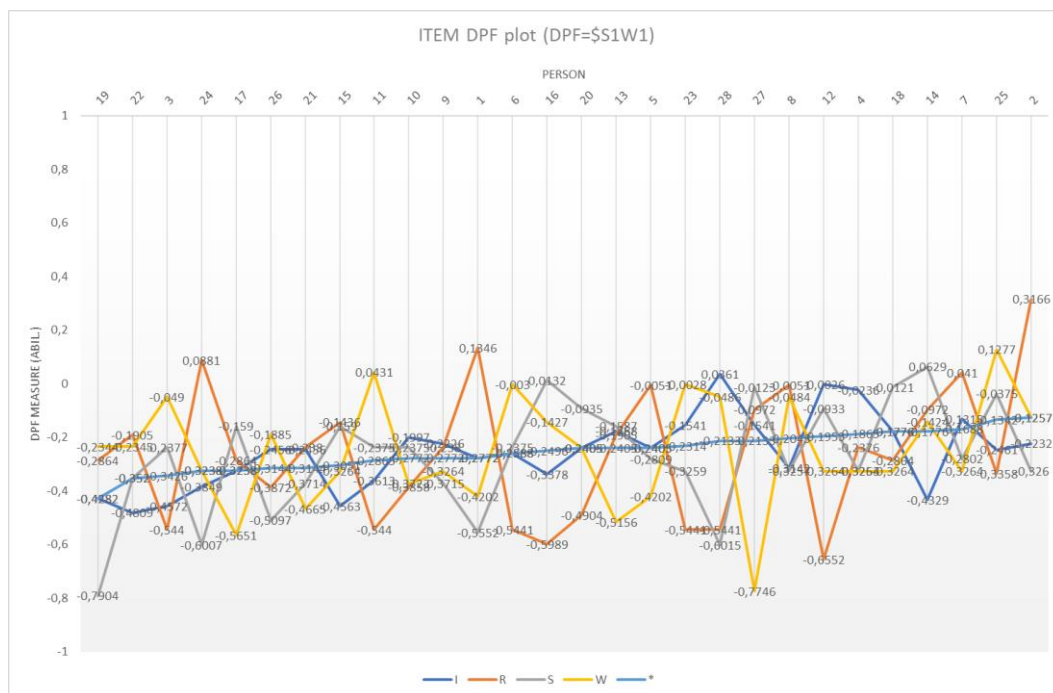
	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	683.8	10.0	-.25	.10	1.01	.06	1.02	.06
SEM	1.5	.0	.01	.00	.09	.17	.08	.17
P.SD	7.6	.0	.07	.00	.45	.90	.43	.90
S.SD	7.7	.0	.07	.00	.46	.91	.43	.92
MAX.	698.0	10.0	-.13	.10	2.38	2.16	2.06	1.94
MIN.	665.0	10.0	-.43	.09	.35	-1.67	.36	-1.71
REAL RMSE	.10	TRUE SD	.00	SEPARATION	.00	PERSON RELIABILITY	.00	
MODEL RMSE	.10	TRUE SD	.00	SEPARATION	.00	PERSON RELIABILITY	.00	
S.E. OF PERSON MEAN = .01								

PERSON RAW SCORE-TO-MEASURE CORRELATION = 1.00  
 CRONBACH ALPHA (KR-20) PERSON RAW SCORE "TEST" RELIABILITY = .00 SEM = 7.58  
 STANDARDIZED (50 ITEM) RELIABILITY = .00

The reliability analysis results in Table 9 show that the person reliability value is 0.00, and the Cronbach Alpha (KR-20) value is also recorded at 0.00, which statistically indicates that the internal consistency between student responses is very low in this measurement model. This value may be caused by several possibilities, such as an insufficient number of items, a narrow range of student ability (low true SD), or homogeneity of scores among respondents. On the other hand, the correlation between raw scores and Rasch measurements (person raw score-to-measure correlation) shows a value of 1.00, indicating full agreement between actual scores and Rasch estimates at the individual level. However, the low overall reliability value suggests that the instrument needs to be reviewed, both in terms of the number of items and the range of difficulty levels, to better distinguish students' literacy abilities in a more stable and consistent manner. This is important in the context of this study, which aims to analyze literacy abilities in depth, so the instrument used must have psychometrically valid sensitivity and precision in measurement.

### Distribution of Persons and Items

To see the balance between student ability levels and item difficulty levels, a person and item distribution analysis was conducted using Rasch mapping. The results of this analysis are presented in Table 10 below.



**Figure 4.** Results of Person and Item Distribution Analysis

Figure 4 shows the distribution of item performance differences (DPF – Differential Person Functioning) based on students' abilities in each literacy indicator in applying short story-based Project-Based Learning. In general, the graph shows that most students have negative DPF scores, meaning that their ability levels tend to be below the item difficulty level, especially on indicators represented by the symbol “W” and “S,” which indicate significant fluctuations below the zero line. This indicates that despite an overall increase in posttest scores, there remains a gap between the complexity of literacy tasks and students' individual readiness, particularly in the rewriting and summarizing indicators. On the other hand, some students show positive DPF, reflecting the success of certain individuals in overcoming the literacy challenges presented, especially in the interpreting (I) and responding (R) indicators. This uneven distribution supports the qualitative finding that the effectiveness of project-based learning depends not only on the model used but is also greatly influenced by students' prior abilities and cognitive strategies. Therefore, these findings reinforce the urgency of your research in comprehensively analyzing the impact of the PjBL model on the variation in literacy abilities of elementary school students individually and contextually.

### Thematic Analysis Process

To gain a deeper understanding of students' learning experiences during the implementation of the short story-based Project-Based Learning model, a thematic analysis was conducted on qualitative data obtained from literacy project narratives and semi-structured interviews. The analysis process and stages are systematically visualized in Figure 5 below.



The PjBL model improves cognitive aspects and strengthens 21st-century skills such as collaboration, communication, creativity, and critical thinking. In the context of project-based learning, students are actively involved in completing tasks that require teamwork, problem solving, and innovation. A study by Rati et al., (2023) shows that the implementation of PjBL oriented towards higher-order thinking skills (HOTS) significantly improves the 4C skills of elementary school students. In addition, research by Albab et al., (2020) confirms that PjBL is effective in developing students' creative thinking and problem-solving skills in mathematics learning. Thus, PjBL plays a crucial role in preparing students to face 21st-century challenges through the development of essential skills.

The implementation of short story-based PjBL also contributes to increasing student motivation and engagement in the learning process. Through relevant and meaningful projects, students feel more motivated to learn and are more active in class activities. A study by Davidson, (2004) shows that a project-based digital storytelling approach increases learning motivation, problem-solving competencies, and student learning achievement. Additionally, research by Kaldi et al., (2011) found that PjBL improves students' positive attitudes toward learning and enhances conceptual understanding. Thus, PjBL not only improves cognitive learning outcomes but also the important affective aspects of the educational process.

Although PjBL has many benefits, its implementation in elementary schools faces several challenges, such as limited resources, time, and teacher training. To overcome this, appropriate strategies are needed, including teacher training in designing and implementing effective projects, as well as support from schools and parents. A study by Pratami et al., (2024) shows that teacher training in PjBL improves their understanding and skills in applying this approach in the classroom. Additionally, integrating PjBL into the Merdeka Belajar curriculum provides flexibility for teachers to adapt learning to local contexts and student needs. With proper support, PjBL can be effectively implemented in elementary schools to enhance the quality of education.

Based on the findings of this study, the implementation of short story-based PjBL has positive implications for the development of literacy among elementary school students. To maximize its benefits, it is recommended that schools and teachers systematically integrate PjBL into the curriculum, taking into account the local context and student needs. Additionally, the development of learning resources that support PjBL, such as digital media and contextual teaching materials, can enhance the effectiveness of learning. Collaboration between teachers, students, parents, and the community is also crucial in creating a supportive learning environment for PjBL. With a holistic and collaborative approach, PjBL can become an effective strategy in enhancing students' literacy skills and 21st-century competencies.

## CONCLUSION

Based on the results of the analysis conducted, both quantitatively and qualitatively, this study concludes that the implementation of Project-Based Learning (PjBL) based on short stories significantly improves the reading and writing skills of elementary school students. Quantitative findings show that students' posttest literacy scores increased significantly compared to their pretest scores, with N-Gain values in the moderate to high category and large effect sizes. This improvement is reflected in five main literacy indicators: identifying main ideas, interpreting word meanings, summarizing text content, writing responses to stories, and rewriting stories from different perspectives. These findings indicate that PjBL is an effective approach for developing functional literacy skills in an integrated manner.

In addition, this study successfully identified a number of supporting and inhibiting factors in the implementation of the PjBL model at the elementary school level. Supporting factors include active student involvement, the relevance of short story themes to everyday life, and cooperation in project groups that strengthen socio-emotional aspects. Meanwhile, the inhibiting factors identified include limited implementation time, differences in initial literacy skills among students, and a lack of experience among teachers in designing project-based learning optimally. These findings were obtained through thematic analysis of project narratives and student interviews, which were coded and visualized using NVivo software.

In line with these results, the main recommendations of this study are directed at teachers and education practitioners to consider systematically integrating the short story-based PjBL model into literacy learning in elementary schools. Teachers are advised to design contextual, collaborative literacy projects based on students' life experiences and to strengthen pedagogical training related to PjBL strategies. Additionally, schools need to provide structural and cultural support to ensure the sustainable implementation and widespread impact of this model. As a result, short story-based PjBL can become an innovative strategy that enhances literacy outcomes and shapes students' character and 21st-century competencies from an early age.

## REFERENCES

- Adnan, A., Adnan, A., Setiawan, F., & Naila, I. (2023). Penerapan Model Project Based Learning (PjBL) Pada Pembelajaran Penulisan Cerpen Kelas VI SD Muhammadiyah 26 Surabaya. *Inovasi Sekolah Dasar: Jurnal Kajian Pengembangan Pendidikan*, 10(1). <https://doi.org/10.36706/jisd.v10i1.20053>
- Albab, U., Budiyo, & Indriati, D. (2020). Metacognition skills and higher order thinking skills (HOTS) in mathematics. *Journal of Physics: Conference Series*, 1613(1), 012017. <https://doi.org/10.1088/1742-6596/1613/1/012017>

- Ayu, N., Triyanty Pulukadang, W., Husain, R., Monoarfa, F., & Katili, S. (2025). Meningkatkan Kemampuan Menulis Cerpen Melalui Model Project Based Learning (PjBL) Pada Siswa Madrasah Ibtidaiyah. *ELEMENTARY: Jurnal Inovasi Pendidikan Dasar*, 5(2). <https://doi.org/10.51878/elementary.v5i2.4820>
- Davidson, M. R. (2004). A phenomenological evaluation: using storytelling as a primary teaching method. *Nurse Education in Practice*, 4(3), 184–189. [https://doi.org/10.1016/S1471-5953\(03\)00043-X](https://doi.org/10.1016/S1471-5953(03)00043-X)
- Kaldi, S., Filippatou, D., & Govaris, C. (2011). Project-based learning in primary schools: effects on pupils' learning and attitudes. *Education 3-13*, 39(1), 35–47. <https://doi.org/10.1080/03004270903179538>
- Misriandi Misriandi, & Galih Maulana Hendrawan. (2024). Pengaruh Literasi Membaca Cerita Pendek Terhadap Pengembangan Kosakata Siswa Sekolah Dasar. *Atmosfer: Jurnal Pendidikan, Bahasa, Sastra, Seni, Budaya, Dan Sosial Humaniora*, 2(2), 168–175. <https://doi.org/10.59024/atmosfer.v2i2.788>
- Nurhadiyah, A., Rusdinal, R., & Fitria, Y. (2020). Pengaruh Model Project Based Learning (PJBL) terhadap Hasil Belajar Siswa di Sekolah Dasar. *Jurnal Basicedu*, 5(1), 327–333. <https://doi.org/10.31004/basicedu.v5i1.684>
- OECD. (2023a). *PISA 2022 Results (Volume I)*. OECD. <https://doi.org/10.1787/53f23881-en>
- OECD. (2023b). *PISA 2022 Results (Volume II)*. OECD. <https://doi.org/10.1787/a97db61c-en>
- Pratami, D., Hasrul Akhmal, N., Isyraf Mohd Maulana, M. I., & Helmi Syed Hassan, S. A. (2024). Introducing project-based learning steps to the preschool teachers in Bandung, Indonesia. *Journal of Technology and Science Education*, 14(3), 883. <https://doi.org/10.3926/jotse.2398>
- Rati, N. W., Arnyana, I. B. P., Dantes, G. R., & Dantes, N. (2023). HOTS-Oriented e-Project-Based Learning: Improving 4C Skills and Science Learning Outcome of Elementary School Students. *International Journal of Information and Education Technology*, 13(6), 959–968. <https://doi.org/10.18178/ijiet.2023.13.6.1892>
- Rohim, D. C., & Rahmawati, S. (2020). Peran Literasi Dalam Meningkatkan Minat Baca Siswa Di Sekolah Dasar. *Jurnal Review Pendidikan Dasar: Jurnal Kajian Pendidikan Dan Hasil Penelitian*, 6(3), 230–237. <https://doi.org/10.26740/jrpd.v6n3.p230-237>
- Suryanti, S., Nursalim, M., Choirunnisa, N. L., & Yuliana, I. (2024). STEAM-Project-Based Learning: A Catalyst for Elementary School Students' Scientific Literacy Skills. *European Journal of Educational Research*, volume-13-(volume-13-issue-1-january-2024), 1–14. <https://doi.org/10.12973/eu-jer.13.1.1>
- Zhang, L., & Ma, Y. (2023). A study of the impact of project-based learning on student learning effects: a meta-analysis study. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1202728>