



Enhancing Elementary School Students' Descriptive Writing Skills Through ThingLink-Assisted Project-Based Learning: A Classroom Action Research

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Abstract

Descriptive writing remains a challenging literacy skill for elementary school students, particularly in developing ideas, organizing information, selecting appropriate vocabulary, and applying language conventions. This study aimed to improve fifth-grade students' descriptive writing skills through ThingLink-assisted Project-Based Learning (PjBL). The study employed a Classroom Action Research design based on the Kemmis and McTaggart model, consisting of planning, action, observation, and reflection stages implemented in two cycles. The participants were 32 fifth-grade students at an elementary school in Central Java, Indonesia. Data were collected through descriptive writing assessments, student activity observations, teacher performance observations, interviews, field notes, and documentation. Students' writing performance was evaluated using an analytic rubric covering content, organization, vocabulary, language use, and mechanics. The findings revealed continuous improvement in students' descriptive writing achievement, with the mean score increasing from 65.00 in the pre-cycle to 73.13 in Cycle I and 79.84 in Cycle II. Learning mastery improved from 40.63% to 87.50%, exceeding the predetermined success criterion. The integration of ThingLink within PjBL provided students with interactive exploration opportunities, richer sources of information, collaborative experiences, and structured support for developing descriptive texts. The study implies that technology-supported Project-Based Learning can serve as an effective approach for enhancing elementary students' writing skills and promoting meaningful literacy development.

Keywords: Descriptive writing; Project-based learning; ThingLink; Digital learning media; Elementary literacy

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INTRODUCTION

Literacy skills are an important indicator of a country's educational quality because they are closely related to students' ability to understand, process, and communicate information effectively (Lastria et al., 2026). The results of the 2022 Programme for International Student Assessment (PISA) showed that Indonesian students' reading literacy performance remained below the average of OECD countries.

Indonesia achieved a reading literacy score of 359, compared with the OECD average of 476 (OECD, 2023). These findings indicate that strengthening literacy competencies remains a challenge within the Indonesian education system. Literacy skills involve not only the ability to comprehend information through reading but also the ability to express ideas in written form (Daryani & Musnr Indra Daulay, 2024). Therefore, Indonesian language learning plays a strategic role in developing writing skills as an essential component of 21st-century literacy competencies (Sa'diah & Bambang, 2026)

Indonesian language learning aims to develop students' ability to communicate effectively through four language skills: listening, speaking, reading, and writing. Among these four skills, writing is considered the most complex because it requires the ability to develop ideas, organize thoughts, and apply language conventions appropriately (Zamiah et al., 2024). This is consistent with the view of Ramadhani & Rosidah (2025), who state that writing skills require a more complex thinking process than other language skills. Writing instruction at the elementary school level also requires a systematic approach and well-structured learning experiences to help students develop both their language proficiency and writing skills (Zohbie & Bhowmik, 2024). Therefore, writing skills are not merely an academic competency but also an essential skill for addressing the challenges of the 21st century (Dewi, 2025).

One of the writing competencies that fifth-grade elementary school students are expected to master is descriptive writing (Zalius & Sukma, 2026). Descriptive texts aim to present detailed descriptions of an object, place, atmosphere, or event so that readers can seemingly see, hear, or experience what is being described (Asyifa & Tania, 2024). To produce high-quality descriptive texts, students are required to observe objects, identify specific characteristics, select appropriate vocabulary, construct effective sentences, and organize ideas coherently (Arjuni et al., 2026; Yulianingsih et al., 2023). The prewriting stage also plays an important role in helping students develop and organize their ideas before transforming them into written form (Mustika et al., 2025). Therefore, teaching descriptive writing requires not only mastery of linguistic aspects but also critical thinking skills and meaningful learning experiences.

Although writing skills play an important role in Indonesian language learning, classroom conditions indicate that students' descriptive writing skills still need to be improved. Based on an interview with the fifth-grade classroom teacher at SD Negeri Ungaran 01 in May 2026, only 13 of the 32 students (40.62%) achieved the Minimum Learning Achievement Criteria (KKTP), while 19 students (59.38%) did not meet the criterion. The teacher explained that most students experienced difficulties in developing ideas based on their observations, selecting appropriate vocabulary, organizing paragraphs coherently, and applying Indonesian spelling and punctuation conventions. This finding is consistent with Lutfiah et al. (2021) who found that elementary school students experienced difficulties in developing ideas, organizing cohesive and coherent paragraphs, selecting appropriate diction, and applying spelling and punctuation in descriptive texts.

In addition, the learning process was still predominantly focused on teacher-provided examples and writing exercises, limiting students' opportunities to explore objects directly. This is important because learning activities that provide students with opportunities to observe objects directly, supported by appropriate media, can help improve descriptive writing skills (Lukman et al., 2023). This problem is also consistent with literature indicating that writing instruction in elementary schools tends to remain conventional, teacher-centered, and focused on final products without sufficient opportunities for exploration (Dewi, 2025; Wulandari, 2023). Such conditions may limit students' opportunities to develop creativity and higher-order thinking skills.

Based on these conditions, an instructional intervention is needed to improve the learning process while enhancing students' writing skills. Classroom Action Research (CAR) was selected because it provides teachers with an opportunity to reflect on their instructional practices, identify weaknesses in the learning process, systematically implement improvement measures, and evaluate the effectiveness of the intervention through several cycles. Therefore, CAR is an appropriate approach for addressing authentic problems that arise in the classroom.

To address these challenges, the Merdeka Curriculum emphasizes student-centered learning through active, contextual, and meaningful learning experiences (Tinah et al., 2026). Teachers are expected to provide learning experiences that encourage students to explore information, collaborate, solve problems, and produce tangible products as a means of applying their knowledge (Sholeh et al., 2024). One learning model that aligns with these characteristics is Project-Based Learning (PjBL) (Purwati et al., 2023; Mudiono, 2024; Rindengan & Merentek, 2025). Project-Based Learning is an instructional model that facilitates students' acquisition of knowledge and skills through an inquiry process focused on authentic problems and resulting in a tangible product as the learning outcome (Wardah et al., 2022). This model provides students with opportunities to learn through projects related to real-world problems, thereby enhancing learning engagement, creativity, critical thinking, and communication skills (Sholeh et al., 2024; Widiastuti et al., 2024; Arochman et al., 2024).

In addition to implementing innovative learning models, the use of interactive digital media is also an important factor in improving the quality of writing instruction. One medium with the potential to support learning is ThingLink (Indra et al., 2024). This platform enables teachers to present images, videos, or virtual environments enriched with interactive hotspots containing text, audio, links, and other supporting information. Through ThingLink, students can explore objects in greater depth before expressing their observations in writing. Prewriting exploration is consistent with the importance of the prewriting stage in helping students develop and organize their ideas before producing written work (Mustika et al., 2025). Such visual, auditory, and interactive learning experiences may enrich students' vocabulary, enhance their observation skills, and facilitate the development of more detailed and systematic descriptive texts (Cham & Hanh, 2026). The characteristics of ThingLink, which allow objects to be presented through interactive images, audio, video, and information hotspots, support the investigation stage of Project-Based Learning.

Previous studies have shown that Project-Based Learning consistently has a positive impact on students' writing skills through project-based learning and authentic learning experiences (Pitriani & Cunandar, 2024; Anggraini & Anggraini, 2026; Kiranti et al., 2024). Meanwhile, studies on ThingLink have indicated that the platform can effectively enhance students' learning motivation, engagement, and learning outcomes through interactive media presentations (Cham & Hanh, 2026). However, previous studies on Project-Based Learning in Indonesian language instruction at the elementary school level have demonstrated its potential to improve writing skills, including the implementation of literacy-based PjBL (Putri & Ganing, 2024) and the use of audiovisual media, picture series, and story-based projects (Anggraini & Anggraini, 2026; Kiranti et al., 2024). Nevertheless, research integrating Project-Based Learning with interactive ThingLink media for teaching descriptive writing in elementary schools remains very limited.

Based on the foregoing discussion, the novelty of this study lies in the integration of the Project-Based Learning syntax with ThingLink as an interactive medium for exploring descriptive objects before students produce written work. This integration has received limited attention in Indonesian language learning at the elementary school level,

particularly within the implementation of the Merdeka Curriculum. Unlike previous studies that have employed audiovisual media, picture series, or story-based projects to support project-based learning, this study utilizes ThingLink as a digital exploratory medium that enables students to examine descriptive objects through interactive images enriched with text, audio, video, and information hotspots. This integration is expected to provide a more authentic learning experience, increase students' engagement in the learning process, and help them develop ideas more systematically before expressing them in written form. In addition to contributing to the development of Indonesian language teaching strategies at the elementary school level, the findings of this study are expected to serve as a reference for teachers in optimizing the use of digital technology to support the implementation of the Merdeka Curriculum and strengthen students' literacy skills.

METHOD

Research Design

This study employed Classroom Action Research (CAR) using the Kemmis and McTaggart (1988) model, which consists of four cyclical stages: planning, action, observation, and reflection. Classroom Action Research was selected because it enables teachers to improve instructional practices while addressing authentic classroom problems. The study was conducted in two cycles, with each cycle consisting of one meeting. The second cycle was implemented based on the reflection results from the first cycle to improve the effectiveness of the instructional process.

The instructional intervention implemented in this study was ThingLink-assisted Project-Based Learning (PjBL). The learning activities followed the six stages of Project-Based Learning, namely determining an essential question, designing the project, developing a project schedule, monitoring project implementation, assessing project outcomes, and evaluating learning experiences. ThingLink functioned as an interactive digital learning medium that enabled students to explore descriptive objects through images enriched with text, audio, video, and interactive hotspots before composing descriptive texts.

Research Participants

The participants of this study consisted of 32 fifth-grade students from SD Negeri Ungaran 01, Central Java, Indonesia, who were enrolled during the second semester of the 2025/2026 academic year. The participants were selected purposively based on the results of preliminary observations and interviews with the classroom teacher, which revealed several challenges in students' descriptive writing abilities. Specifically, many students experienced difficulties in generating and developing ideas, organizing information into coherent paragraphs, selecting appropriate descriptive vocabulary, and applying correct spelling and punctuation conventions. These initial conditions indicated that students required a more engaging and structured instructional approach to support their writing development. The preliminary writing assessment showed that only 13 students (40.62%) achieved the Minimum Learning Achievement Criteria (KKTP), whereas the majority of students had not reached the expected standard. Therefore, the class was considered an appropriate context for implementing the intervention aimed at improving students' descriptive writing skills through ThingLink-assisted Project-Based Learning.

Research Instruments

The study employed test and non-test instruments to collect quantitative and qualitative data. The test instrument consisted of descriptive writing tasks administered during the pre-cycle, Cycle I, and Cycle II. Students' writing products were assessed

using an analytic scoring rubric developed based on the Learning Outcomes (Capaian Pembelajaran) of Bahasa Indonesia Phase C in the Merdeka Curriculum. The rubric evaluated five aspects of descriptive writing: content, organization, vocabulary, language use, and mechanics.

Table 1 Analytical Rubric for Assessing Descriptive Writing Skills

Aspect	Indicators	Score
Content	Relevance, completeness, and clarity of ideas	20
Organization	Logical organization and coherence	20
Vocabulary	Appropriate word choice	20
Language Use	Grammar and sentence structure	20
Mechanics	Spelling, punctuation, capitalization	20
Total		100

The non-test instruments included classroom observation sheets, interview guidelines, field notes, and documentation. Observation sheets were used to record teacher performance and students' learning activities during the implementation of ThingLink-assisted Project-Based Learning. Interviews with the classroom teacher were conducted before and after the intervention to identify classroom problems and evaluate the instructional process.

Table 2 Main Observation Aspects and Indicators

Observed Aspect	Indicator
Teacher Activities	Implementation of Project-Based Learning syntax
Teacher Activities	Classroom management
Teacher Activities	Utilization of ThingLink
Teacher Activities	Guidance and feedback during project activities
Teacher Activities	Facilitation of students' writing activities
Student Activities	Participation in project activities
Student Activities	Collaboration
Student Activities	Engagement with ThingLink
Student Activities	Observation and information exploration
Student Activities	Presentation
Student Activities	Writing descriptive texts

Table 2 presents the main aspects and representative indicators used to observe teacher performance and students' learning activities. The complete observation instruments consisted of 20 indicators for teacher activities and 17 indicators for student activities. Each indicator was assessed using an observation scale, and the obtained scores were converted into percentages to determine the level of implementation and student engagement in each research cycle.

Research Procedure

The research was conducted in two action cycles, each consisting of four stages: planning, action, observation, and reflection, following the Kemmis and McTaggart model. The four stages constituted the research procedure, while the six stages of Project-Based Learning (PjBL) constituted the instructional intervention implemented during the action stage. Thus, PjBL was not treated as a separate research cycle but as the learning model applied during the action stage of each cycle. During the planning stage, the researcher prepared the lesson plans, designed the ThingLink learning media, developed project worksheets, prepared the research instruments, and developed the descriptive writing assessment rubric.

During the action stage, the teacher implemented ThingLink-assisted Project-Based Learning by following six stages of PjBL: (1) determining an essential question, (2) designing the project, (3) developing a project schedule, (4) monitoring project implementation, (5) assessing project outcomes, and (6) evaluating learning experiences. During the observation stage, teacher performance and students' learning activities were recorded using observation sheets. Students' descriptive writing products were assessed using the analytic scoring rubric. Field notes and documentation were also collected to record important events during the instructional process. During the reflection stage, the researcher analyzed the strengths and weaknesses identified during each cycle. The reflection results were used to determine the improvements required for the subsequent cycle.

Table 3. Integration of ThingLink Across the Stages of Project-Based Learning

PjBL Stage	Learning Activities	ThingLink Integration
Determining an Essential Question	The teacher introduced a contextual topic and guided students to identify the object to be described.	Students observed interactive images and videos through ThingLink to identify the characteristics of the object.
Designing the Project	Students determined the project outcome and planned the descriptive writing task collaboratively.	Students explored hotspot information (text, audio, images, and videos) to gather information about the object.
Developing a Project Schedule	Students arranged the timeline and divided group responsibilities.	ThingLink remained accessible as a learning resource throughout the project.
Monitoring Project Progress	The teacher monitored group discussions and provided feedback during the writing process.	Students revisited the interactive hotspots to verify and enrich descriptive details.
Assessing Project Outcomes	Students presented their descriptive texts and received feedback from the teacher and peers.	ThingLink served as a reference for validating the accuracy and completeness of the descriptions.
Evaluating Learning Experiences	Teacher and students reflected on the learning process and writing outcomes.	Students discussed how ThingLink supported idea development and descriptive writing.

As presented in Table 3, ThingLink was integrated into every stage of Project-Based Learning to facilitate students' exploration of descriptive objects and support the development of their descriptive writing skills. This integration enabled students to obtain information through interactive exploration before composing their descriptive texts, while the teacher continuously monitored and guided the learning process throughout the project.

Data Analysis

The collected data were analyzed using descriptive quantitative and qualitative techniques. Quantitative data obtained from students' descriptive writing scores were analyzed by calculating the mean score and the percentage of students achieving the Minimum Learning Achievement Criteria (KKTP) in each cycle. The improvement in students' descriptive writing skills was determined by comparing the results of the pre-cycle, Cycle I, and Cycle II.

Qualitative data obtained from classroom observations, interviews, field notes, and documentation were analyzed using the interactive model of Miles, Huberman, and Saldaña (2014), which includes data condensation, data display, and conclusion drawing/verification. The qualitative findings were used to complement the quantitative results and provide a comprehensive understanding of the implementation of ThingLink-

assisted Project-Based Learning. The action was considered successful when at least 80% of the students achieved the Minimum Learning Achievement Criteria (KKTP) of 75. In addition, improvements in students' descriptive writing skills and active participation during the implementation of ThingLink-assisted Project-Based Learning across the action cycles were considered indicators of successful instructional improvement.

RESEARCH FINDINGS

Pre-cycle Findings

The pre-cycle was conducted to identify students' initial descriptive writing skills before the implementation of ThingLink-assisted Project-Based Learning. Students completed an individual descriptive writing task, which was assessed using an analytic writing rubric consisting of five aspects: content, organization, vocabulary, language use, and mechanics. The pre-cycle results are presented in Table 4.

Table 4. Students' Descriptive Writing Achievement in the Pre-cycle

Indicator	Result
Number of students	32
Highest score	85
Lowest score	40
Mean score	65.00
Students achieving KKTP (≥ 75)	13
Students not achieving KKTP	19
Learning mastery	40.63%

The results showed that the mean score was 65.00, which was below the KKTP of 75. Of the 32 students, 13 students (40.63%) achieved the KKTP, while 19 students (59.37%) did not. The highest score was 85, while the lowest score was 40. Analysis of the students' writing products showed difficulties in developing ideas into detailed descriptions. Many texts contained general information with limited supporting details. Students also experienced difficulties in organizing ideas coherently, selecting appropriate descriptive vocabulary, constructing effective sentences, and applying spelling and punctuation correctly.

Cycle I Findings

Cycle I implemented ThingLink-assisted Project-Based Learning to address the problems identified during the pre-cycle. Students explored descriptive objects through interactive media containing images, text, audio, video, and interactive hotspots. The exploration activities were followed by collaborative project activities and individual descriptive writing. The quantitative results of Cycle I are presented in Table 5.

Table 5. Students' Descriptive Writing Achievement in Cycle I

Indicator	Result
Number of students	32
Highest score	90
Lowest score	50
Mean score	73.13
Students achieving KKTP (≥ 75)	21
Students not achieving KKTP	11
Learning mastery	65.63%

The results showed an improvement in students' descriptive writing achievement compared with the pre-cycle. The mean score increased from 65.00 in the pre-cycle to 73.13 in Cycle I, representing an increase of 8.13 points. The number of students

achieving the KKTP increased from 13 to 21 students, while learning mastery increased from 40.63% to 65.63%.

Analysis of the students' writing products showed that some students were able to develop more detailed descriptions after the implementation of the learning activities. However, several students still produced relatively short descriptions and provided insufficient supporting details. Difficulties were also observed in organizing ideas into coherent paragraphs and applying appropriate grammar, spelling, and punctuation. Some students also required teacher guidance when exploring information in ThingLink and developing descriptive vocabulary. Students' learning activities during Cycle I reached 83.82%. The students participated in ThingLink exploration, collaborative project activities, discussion, and individual writing activities. However, some students still required guidance during the exploration and writing processes. Since learning mastery in Cycle I reached 65.63%, which was below the predetermined criterion of 80%, the research continued to Cycle II. The results of Cycle I were used as the basis for improving the learning activities in the subsequent cycle.

Reflection of Cycle I

The reflection stage was conducted to identify the strengths and limitations of the implementation of the intervention in Cycle I. The observation results indicated that students were generally active during the learning activities, but several students still needed more structured guidance in utilizing the information available through ThingLink and developing their ideas into descriptive writing. The reflection also indicated that time management during digital media exploration needed to be improved. Some students spent considerable time exploring the interactive features, while others still depended on teacher assistance to identify relevant descriptive information. Therefore, the teacher planned to provide clearer instructions concerning the exploration process, set more appropriate time limits, encourage students to record important descriptive vocabulary, and provide more targeted feedback during the writing process. Based on these reflection results, the learning activities in Cycle II were modified while maintaining the core intervention of ThingLink-assisted Project-Based Learning. The modifications were intended to increase students' focus, encourage more equal participation, improve idea development, and strengthen students' descriptive vocabulary and writing accuracy.

Cycle II Findings

Cycle II was implemented based on the reflection results from Cycle I. The learning activities were improved by providing clearer guidance during ThingLink exploration, strengthening students' group discussions, and providing additional support in developing ideas, organizing paragraphs, and applying appropriate language conventions. Students continued to use ThingLink to explore descriptive objects before completing their individual descriptive writing tasks. The results of Cycle II are presented in Table 6.

Table 6. Students' Descriptive Writing Achievement in Cycle II

Indicator	Result
Number of students	32
Highest score	95
Lowest score	60
Mean score	79.84
Students achieving KKTP (≥ 75)	28
Students not achieving KKTP	4
Learning mastery	87.50%

The results showed further improvement in students' descriptive writing achievement. The mean score increased from 73.13 in Cycle I to 79.84 in Cycle II, representing an increase of 6.71 points. The number of students achieving the KKTP increased from 21 to 28 students, while the number of students who had not achieved the criterion decreased from 11 to 4 students. Learning mastery increased from 65.63% in Cycle I to 87.50% in Cycle II, exceeding the predetermined criterion of 80%. Analysis of the students' writing products showed improvement in their ability to develop ideas, organize descriptive information, select appropriate vocabulary, construct sentences, and apply spelling and punctuation. Students also demonstrated greater independence during the writing process and required less teacher assistance than in Cycle I.

Students' learning activities in Cycle II reached 86.76%, indicating an improvement compared with the 83.82% achieved in Cycle I. Teacher performance also increased from 82.50% in Cycle I to 86.25% in Cycle II. The improved classroom activities were reflected in students' participation during ThingLink exploration, group discussion, project completion, and individual writing. Since learning mastery reached 87.50%, exceeding the predetermined success criterion of 80%, the research was concluded after Cycle II.

Students' Learning Activities Across Research Cycles

In addition to students' writing achievement, observations were conducted to examine students' participation during the implementation of ThingLink-assisted Project-Based Learning. The observation instrument consisted of 17 indicators with a maximum score of 68.

Table 7. Students' Learning Activities Across Research Cycles

Indicator	Cycle I	Cycle II
Total score	57	59
Maximum score	68	68
Percentage	83.82%	86.76%
Category	Good	Very Good

Table 7 shows that students' learning activities improved from 83.82% in Cycle I to 86.76% in Cycle II, representing an increase of 2.94 percentage points. In Cycle I, students generally demonstrated active participation in the learning activities and were able to engage with the ThingLink media. However, several students still required teacher guidance when exploring the interactive features and developing ideas for their descriptive texts. Some students also tended to focus excessively on repeatedly exploring the hotspots rather than recording relevant information. Following the reflection of Cycle I, the teacher provided more structured instructions concerning how to explore ThingLink and encouraged students to identify and record relevant descriptive vocabulary.

In Cycle II, students demonstrated greater focus during media exploration, increased confidence in writing, and greater willingness to assist peers during group activities. These changes were reflected in the increase in the observation score from the "Good" to the "Very Good" category. The improvement in student activity accompanied the improvement in descriptive writing achievement. However, the observation data are interpreted as supporting evidence of the learning process rather than as statistical evidence of a causal relationship between student activity and writing achievement.

Teacher Performance Across Research Cycles

Teacher performance was also observed to determine the extent to which the instructional intervention was implemented according to the planned learning activities.

The teacher observation instrument consisted of 20 indicators with a maximum score of 80.

Table 8. Teacher Performance Across Research Cycles

Indicator	Cycle I	Cycle II
Total score	66	69
Maximum score	80	80
Percentage	82.50%	86.25%
Category	Good	Very Good

As shown in Table 8, teacher performance increased from 82.50% in Cycle I to 86.25% in Cycle II, representing an improvement of 3.75 percentage points. In Cycle I, the teacher demonstrated good implementation of the Project-Based Learning stages and utilized ThingLink as an interactive learning medium. The teacher also provided individual and group guidance to students who experienced difficulties in developing ideas and selecting appropriate vocabulary. Nevertheless, the observation indicated that the allocation of time for exploring the digital media could be managed more effectively and that students needed greater encouragement to develop descriptive vocabulary independently.

Based on the reflection, improvements were introduced in Cycle II, particularly in managing the duration of ThingLink exploration and providing more targeted feedback during the writing process. The teacher also strengthened guidance related to descriptive vocabulary and ensured that students had sufficient time to complete their writing. These improvements were reflected in the increase in teacher performance to 86.25%, categorized as "Very Good."

Improvement in Students' Descriptive Writing Aspects Across Research Cycles

Students' improvement was also analyzed according to the five aspects assessed through the analytic writing rubric: content, organization, vocabulary, language use, and mechanics.

Table 9. Improvement in Students' Descriptive Writing Aspects Across Research Cycles

Writing Aspect	Pre-cycle	Cycle I	Cycle II
Content	16.88	18.44	19.53
Organization	16.09	17.34	18.44
Vocabulary	11.88	15.00	16.87
Language Use	11.25	12.66	13.75
Mechanics	8.91	9.69	11.25

Table 9 indicates that all five aspects of descriptive writing improved progressively throughout the research cycles. The content aspect increased from 16.88 in the pre-cycle to 19.53 in Cycle II. This improvement indicates that students were increasingly able to develop relevant and detailed ideas. The exploration of descriptive objects through ThingLink provided students with additional information that could be used to enrich the content of their writing. The organization aspect increased from 16.09 to 18.44. This indicates an improvement in students' ability to organize ideas more systematically and connect information into coherent descriptions. Project planning, collaborative discussion, and teacher guidance provided opportunities for students to organize information before composing their individual texts.

The greatest improvement was observed in the vocabulary aspect, which increased from 11.88 in the pre-cycle to 16.87 in Cycle II. The increase of 5.00 points suggests that the interactive exploration provided by ThingLink helped students encounter and use a wider range of descriptive vocabulary. The availability of visual and

multimedia information also gave students contextual references when selecting words to describe objects.

The language use aspect increased from 11.25 to 13.75. This improvement indicates gradual development in students' ability to construct sentences and apply appropriate language structures. Teacher feedback during the writing process contributed to students' opportunities to identify and improve language-related errors. The mechanics aspect increased from 8.91 to 11.25. Students demonstrated improvement in the application of spelling, capitalization, and punctuation. Repeated writing practice and feedback across the research cycles provided opportunities for students to improve the technical accuracy of their writing. Overall, the improvement in all five aspects indicates that the intervention supported multiple components of descriptive writing rather than improving only students' overall scores.

Discussion

The findings of this classroom action research demonstrate that the implementation of ThingLink-assisted Project-Based Learning (PjBL) contributed positively to improving fifth-grade students' descriptive writing skills. The improvement was reflected in the progressive increase in students' mean writing scores from 65.00 in the pre-cycle to 73.13 in Cycle I and 79.84 in Cycle II. In addition, the percentage of students achieving the Minimum Learning Achievement Criteria (KKTP) increased substantially from 40.63% in the pre-cycle to 65.63% in Cycle I and 87.50% in Cycle II, exceeding the predetermined success criterion of 80%. These findings indicate that the integration of Project-Based Learning with interactive digital media created meaningful opportunities for students to explore objects, develop ideas, organize information, and transform observations into descriptive texts. This result confirms previous studies showing that Project-Based Learning can enhance students' writing performance by providing authentic learning experiences, opportunities for collaboration, and structured writing processes (Pitriani & Cunandar, 2024; Putri & Ganing, 2024; Rindengan & Merentek, 2025).

The improvement in students' descriptive writing skills can be explained by the characteristics of Project-Based Learning, which emphasizes inquiry, investigation, collaboration, product creation, and reflection. Unlike conventional writing instruction that often asks students to directly produce texts based on limited examples, PjBL provides a sequence of activities that allows learners to gather information before writing. In this study, students first explored descriptive objects through ThingLink, discussed the information obtained, and subsequently used these findings as the foundation for composing descriptive texts. This learning sequence supported the prewriting stage, which is considered essential in helping students generate and organize ideas before transforming them into written language. Similar findings were reported by Mustika et al. (2025), who emphasized that prewriting activities provide important support for elementary students in developing ideas and improving writing quality.

The contribution of ThingLink as an interactive digital medium represents an important extension of previous Project-Based Learning research. Previous studies have demonstrated that PjBL can improve writing skills through authentic tasks and collaborative learning processes; however, many implementations have relied on conventional resources such as worksheets, picture series, or audiovisual materials (Anggraini & Anggraini, 2026; Kiranti et al., 2024). The present study extends this body of knowledge by integrating ThingLink, which enables students to interact with multimedia-based learning environments containing images, videos, audio, text, and interactive hotspots. This combination provides richer sources of information compared with traditional writing preparation activities. Students were able to observe descriptive

objects from multiple perspectives, collect relevant vocabulary, and identify specific characteristics before writing. This finding supports previous research indicating that interactive multimedia platforms can increase student engagement and support learning through multimodal representation (Indra et al., 2024; Cham & Hanh, 2026).

The improvement was also evident across the five dimensions of descriptive writing assessed in this study, including content, organization, vocabulary, language use, and mechanics. The content aspect increased from 16.88 in the pre-cycle to 19.53 in Cycle II, indicating that students became more capable of developing relevant and detailed ideas. The organization aspect improved from 16.09 to 18.44, showing that students gradually developed better abilities to arrange information into coherent descriptions. The largest improvement occurred in vocabulary, which increased from 11.88 to 16.87. This finding suggests that ThingLink's interactive features provided students with contextual exposure to new descriptive words and helped them select more appropriate vocabulary for expressing their observations. This result is consistent with research emphasizing that meaningful exposure to contextual information supports vocabulary development and improves students' ability to produce richer written texts.

The improvement in vocabulary and content development also confirms the importance of providing students with direct or virtual observation experiences before writing. Previous research has indicated that elementary students often experience difficulties in descriptive writing because they lack sufficient ideas, vocabulary resources, and experience observing objects in detail (Lutfiah et al., 2021). The initial condition of the participants in this study reflected this challenge, as only 13 out of 32 students (40.62%) achieved the KKTP before the intervention, and many students experienced difficulties in developing ideas, organizing paragraphs, selecting vocabulary, and applying spelling and punctuation conventions. The improvement after implementing ThingLink-assisted PjBL suggests that providing structured exploration before writing can address these common challenges in elementary writing instruction.

The findings regarding student engagement and teacher performance further strengthen the interpretation of the effectiveness of the intervention. Student learning activity increased from 83.82% in Cycle I to 86.76% in Cycle II, whereas teacher performance improved from 82.50% to 86.25%. These improvements indicate that the success of the intervention was not only related to the digital media itself but also to the quality of instructional implementation. Reflection after Cycle I allowed the teacher to improve time management, provide clearer instructions for ThingLink exploration, and give more targeted feedback during writing activities. This finding supports the principles of Classroom Action Research, where continuous reflection and modification of teaching practices contribute to instructional improvement (Kemmis & McTaggart, 1988).

Although the findings confirm previous research on PjBL and technology-supported learning, this study also provides several extensions. First, it demonstrates the potential of combining PjBL with an interactive exploration platform specifically for descriptive writing instruction at the elementary school level. Previous studies have examined PjBL or digital media separately, but research integrating ThingLink within the complete PjBL process remains limited. Second, this study highlights that digital media should not merely function as a presentation tool but as an exploratory environment that supports observation, information gathering, and meaning construction before writing. Therefore, the contribution of ThingLink lies not only in increasing student motivation but also in supporting the cognitive processes involved in writing development.

Nevertheless, the findings should be interpreted within the limitations of the classroom action research context. The study involved only 32 students from one

elementary school and consisted of two intervention cycles; therefore, the findings cannot be generalized directly to all elementary school contexts. In addition, the effectiveness of ThingLink implementation may depend on technological availability, internet access, students' digital literacy, and teacher readiness. Future research should involve larger samples, different school contexts, and comparative research designs to examine whether ThingLink-assisted PjBL produces similar outcomes across diverse learning environments. Future studies may also investigate the application of this approach to other language skills, such as narrative writing, reading comprehension, or oral communication.

This study contributes to the growing field of technology-enhanced language learning by demonstrating that the integration of interactive digital media and Project-Based Learning can provide meaningful support for elementary students' descriptive writing development. The findings suggest that effective writing instruction requires not only attention to linguistic accuracy but also opportunities for exploration, creativity, collaboration, and authentic knowledge construction.

CONCLUSION

This classroom action research concludes that ThingLink-assisted Project-Based Learning provides an effective instructional approach for supporting fifth-grade students' descriptive writing development. The implementation of the intervention resulted in continuous improvement across two research cycles, demonstrated by the increase in students' mean writing scores from 65.00 in the pre-cycle to 79.84 in Cycle II and the improvement of learning mastery from 40.63% to 87.50%. The improvement was not limited to overall writing achievement but was also reflected in the five assessed components of descriptive writing, namely content, organization, vocabulary, language use, and mechanics. The integration of ThingLink within Project-Based Learning enabled students to explore descriptive objects through interactive multimedia resources, obtain relevant information, enrich vocabulary, organize ideas, and construct more detailed descriptive texts. Therefore, the findings suggest that combining inquiry-based learning with interactive digital exploration can create a more meaningful and learner-centered writing environment.

The study also highlights the importance of designing writing instruction that provides students with opportunities to observe, investigate, collaborate, and reflect before producing written work. ThingLink-assisted PjBL offers a practical strategy for teachers seeking to implement technology-supported learning aligned with the principles of the Merdeka Curriculum, particularly through active, contextual, and meaningful learning experiences. However, because this study was conducted within a limited classroom context involving one group of students, further research involving larger populations, different educational settings, and comparative research designs is recommended to examine the broader applicability of this approach. Future studies may also explore how ThingLink-assisted PjBL can support other literacy skills and investigate the long-term effects of technology-integrated project-based writing instruction.

RECOMMENDATION

This study has some limitations. It was conducted with only 32 fifth-grade students in one elementary school and involved two action cycles, which may limit the generalizability of the findings to other grade levels and school contexts. The implementation of ThingLink also depended on the availability of digital devices, internet connectivity, sufficient learning time, and students' digital literacy, which may influence the effectiveness of the intervention. Future research should involve more schools and participants from different contexts to obtain broader comparative findings.

Further studies could also examine the use of ThingLink-assisted Project-Based Learning for other language skills or compare it with other digital learning media and instructional models.

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DECLARATION OF USING AI TOOLS

The authors state that OpenAI ChatGPT and Grammarly were used exclusively for language refinement, grammar checking, translation, and improving the clarity and organization of the manuscript. These AI tools were not used for data collection, data analysis, interpretation of research findings, or the development of scholarly arguments. All research procedures, data, analysis, interpretation of findings, and scholarly arguments were conducted and developed by the authors. The authors take full responsibility for the accuracy, originality, and final content of the manuscript. The use of AI tools complied with academic integrity and ethical publication standards.

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