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Research Article

IMPLEMENTATION OF DEEP LEARNING BASED PEER TEACHING IN DESCRIPTIVE TEXT WRITING LEARNING FOR STUDENTS OF STATE JUNIOR HIGH SCHOOL

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Abstract

This study examines how well State Junior High School 4 Purworejo pupils' descriptive writing abilities are improved by peer instruction based on deep learning. While prior research has looked at peer teaching to improve collaborative learning and deep learning to foster higher order thinking, there are still few studies that combine both strategies in the context of descriptive text writing. This gap makes the current study a unique contribution. A quasi experimental non equivalent control group design was combined with a qualitative examination of students' views in a mixed method methodology. Purposive sampling was used to choose 60 students, who were split evenly between the experimental and control groups. An analytical rubric comprising topic, structure, vocabulary, grammar, and mechanics was used to assess writing skills. Compared to the control group (74.2), the experimental group's mean posttest score was higher (83.4). The superior efficacy of the suggested model was demonstrated by an independent t-test, which yielded a significant value of 0.003 ($p < 0.05$). Students in the experimental group reported more knowledge (87%), greater writing confidence (81%), and higher motivation (90%), according to qualitative results from surveys and interviews. These findings demonstrate that incorporating deep learning concepts knowledge construction, reflective inquiry, and meaningful collaboration into peer instruction provides a pedagogically sound and theoretically sound strategy for enhancing descriptive writing abilities.

Keywords: peer teaching, deep learning, learning to write, descriptive text

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INTRODUCTION

The era of ever increasing technological and information development makes writing skills increasingly crucial for every individual to learn and master, especially among students. Nurhayati et al., (2023) states that writing is an activity that anyone can do to convey ideas, thoughts, or emotions through written form. Writing skills are an integral part of the teaching and learning process in schools. Writing activities make students more active during learning and improve their sentence structure (Sun et al., 2025). Writing skills are one of the fundamental skills in the language learning process. Writing is not only about conveying thoughts, ideas, and information in writing, but also helps hone students' critical, systematic, and creative thinking skills.

As is well known, the four components of language skills are interconnected (Mustika et al., 2025; Kurniati & Fitri, 2024). One form of writing skill focused on at the junior high school level is the ability to write descriptive texts (Pratiwi & Kurniasari, 2023). Descriptive texts aim to describe objects, places, or events clearly and in detail, thereby stimulating the reader's imagination and understanding (Ismail & Prasetya, 2024). These texts are characterized by the presence of concrete words, strong sensory descriptions, and sentence structures that stimulate the reader's imagination. Dimas Yusuf Afrizal (2023:64) states that descriptive text is a piece of writing that describes or explains something according to its actual condition (Arseven & Bal, 2025). Descriptive text is one part of the writing learning process at the junior high school level. The skill of writing descriptions is one of the very important competencies for junior high school students. The purpose of this descriptive text is for readers to be able to imagine or understand well what the writer is describing (Huang & Ma, 2025). A descriptive paragraph is a paragraph that provides a detailed and clear explanation of an object, location, or event, so that readers can understand or feel what the writer wants to convey. Hidayat & Mulyono, (2024)

However, students' writing skills are still considered low. This is due to overly rigid teaching methods, which create the perception that writing is difficult. This also occurs at SMP N 4 Purworejo. Few teachers areable to convey subject matter in an appropriate and engaging manner (Mulyani & Rachman, 2025). Therefore, it is not surprising that students ultimately find writing difficult and dislike it. Students are not fully prepared to write a work, determine ideas based on the desired theme, also still feel confused. They need to be given examples first to open their minds. Students do not write their ideas in rough form first. As a result, they sometimes forget the ideas they want to express in words or sentences. Furthermore, the organization of ideas produced by students is still disorganized because the words or sentences are not fully connected. Students still face challenges in expressing what to write and are confused about where to begin their writing, without paying attention to spelling, capitalization, and sentence order.

According to Ji & Zhang, (2025), much of the teaching process in schools is still conducted in a traditional manner. Teachers only lecture and use less engaging methods. In response to these issues, peer teaching solutions are needed to improve students' skills, particularly at the junior high school level, in learning to write descriptive texts. The peer teaching method is a learning structure in which material is taught with support from peers. Peer teaching provides opportunities for students to be more involved in learning and creates a space for them to ask questions and discuss with their peers without feeling awkward. This way, students can better understand concepts through direct experience, and the learning atmosphere becomes more engaging and meaningful (Chen et al., 2025). The peer teaching method uses an approach in which one child explains the material to another peer, where the student explaining the material is more knowledgeable than the other students. This learning approach is very suitable for application in the process of learning to write descriptive texts, because it can improve students' writing skills (Liu et al., 2025). Peer teaching fosters effective

communication among students, promotes independent learning, and helps in increasing their self esteem. Gaffar, Fadilah, & Nopita, (2024).

If students are not actively involved in learning, simply listening to the teacher explain the material and sitting still, they may not understand the information conveyed by the teacher, feel bored, and lack motivation to learn (Gita et al., 2025). This can result in learning objectives not being achieved and reduce students' cognitive outcomes. Student achievement is influenced not only by teaching methods but also by student engagement in learning activities. Students who are active in their classroom learning can achieve not only cognitive goals but also emotional aspects. To address this problem, peer teaching methods can involve students in an active role in the learning process.

Peer mentoring and peer tutoring, although often used interchangeably, operate on distinct theoretical foundations within collaborative learning. Peer mentoring emphasizes guiding peers through questioning, clarification, and reflective dialogue, allowing mentors to facilitate cognitive scaffolding rather than directly instructing (Mufidah & Tirtoni, 2023). In contrast, peer tutoring positions students as instructional agents who deliver explanations, model skills, and provide structured academic support to their peers (Warni & Eliya, 2023). When synthesized, both approaches contribute to a learning environment grounded in social constructivism, where knowledge is co-constructed through interaction and shared problem-solving (Cheung et al., 2025). Empirical studies show that such peer-mediated learning not only enhances content mastery but also strengthens socio-emotional competencies including confidence, communication, and interpersonal regulation because students learn in a psychologically safe and egalitarian context. Zahra Salsabila & Saddhono, (2024).The intimate and supportive atmosphere typical of peer teaching encourages students to ask questions freely, engage in dialogue, and negotiate meaning, which in turn promotes autonomy and deeper cognitive processing. Thus, peer mentoring and peer tutoring collectively create a collaborative learning climate that enhances both academic outcomes and students' social-emotional development.

Nengah Wijana, et al. (2023) stated that the preparation stages for using the peer tutoring method are as follows: (1) The teacher prepares a teaching plan for one topic divided into several subtopics. Each subtopic includes a title, learning objectives, and instructions for tasks that need to be completed in one meeting. (2) Selecting a number of qualified students to be peer tutors. The number of tutors selected is adjusted to the number of groups formed. (3) Conducting training for tutors. In this tutoring process, students who act as tutors act as teachers. Therefore, the training held by the teacher functions as education for these students. The training is carried out using two methods, namely small group sessions where only students who are tutors receive training, and classical sessions where all students are trained in the tutoring process. (4) Forming student groups consisting of 4 to 6 people. These groups are formed based on the various levels of student intelligence. Thus, peer teaching can be an alternative to improve writing skills, including in writing descriptive texts, because through interaction and collaboration, students can provide input to each other, correct mistakes, and improve the quality of their writing. Warni & Eliya, (2023).

On the other hand, deep learning in education can provide automatic analysis and personalized feedback on student writing (Misgna et al., 2024). Deep learning refers to learning methods that emphasize not only mastery of knowledge but also the development of critical thinking, collaboration, creativity, and communication skills (Al-Hassan et al., 2025). This approach encourages students to actively connect new material to their experiences for meaningful learning, to pay full attention to the learning process, and to enjoy the learning process with joy (Mustika et al., 2025). This approach emphasizes in-depth, contextual, and meaningful learning, thereby actively developing students' critical thinking skills and creativity. This approach can be applied to improve the quality of learning, develop essential skills for the 21st century, and enhance students' understanding of the material in a deeper way

(Andi Nur Isnayanti, Putriwanti, Kasmawati, 2025). In an educational context, deep learning refers to learning that is not merely superficial, but involves in-depth understanding, critical analysis, and the application of concepts in various real life situations (Pu et al., 2025). This learning is expected to foster active student participation, whether through discussion, experimentation, or reflection, so that students can identify their weaknesses and strive to improve them. With a meaningful, attentive, and enjoyable learning environment, deep learning can increase motivation while equipping students with higher-order thinking skills that are crucial in this modern era.

Learning to write using a deep learning-based peer-to-peer teaching model is a new method that combines collaboration between students and the use of artificial intelligence technology to strengthen understanding and writing skills. In this approach, students not only become learners but also serve as teachers for their peers, creating an interactive and supportive learning atmosphere (Kuo et al., 2025). Through peer teaching, students are encouraged to explain ideas, provide feedback, and critically discuss their writing. This has been shown to enhance critical thinking skills, creativity, and a sense of responsibility for their own learning. Integrating deep learning, both as a teaching concept and as a technology, strengthens this process by offering in-depth analysis of writing, providing tailored feedback, and facilitating learning tailored to each student's individual needs. This approach not only improves the quality of student writing but also builds a collaborative learning community, where each member actively contributes to shared academic development and can connect new knowledge to prior experiences in more meaningful ways.

The development of a learning model using deep learning-based peer teaching to improve writing skills is highly suitable for implementation at SMP N 4 Purworejo as an innovation in addressing learning challenges. This model is expected to create a more interactive, communicative, and technology-focused learning environment. Combining deep learning-based peer teaching is expected to increase students' enthusiasm for learning, strengthen their engagement in learning activities, and substantially improve writing skills, a crucial skill in language learning (Kassis et al., 2025). The integration of peer tutoring and deep learning approaches offers a significant opportunity to create a more efficient writing learning model. Engaging and developmentally appropriate learning experiences provide a more meaningful experience. Students will feel more relaxed and less embarrassed during the learning process. Peer encouragement will boost self confidence and improve their learning outcomes.

Furthermore, students who have achieved high levels of achievement will be more engaged in their learning, while those who are still struggling can benefit from peer tutors through group learning activities. Gaffar et al., (2024). In this model, students gain knowledge not only from the instructor but also from their peers through in-depth discussion, collaboration, and reflection (Santos et al., 2025). Deep learning offers a framework for critical, creative, and collaborative thinking, while peer tutoring creates a space for equal interaction and supports a more intimate learning environment. In this way, the combination of the two is expected to significantly improve students' descriptive writing skills, foster a sense of responsibility for the learning process, and foster sustainable learning motivation.

Based on this background, this study focuses on the implementation of deep learning-based peer teaching in writing descriptive texts. This is expected to significantly improve students' descriptive writing skills, create more effective and efficient learning, and inspire other schools to adopt technology in their learning. Furthermore, this research contributes to the advancement of technology based Indonesian language education in Indonesia.

RESEARCH METHOD

Research Design

This study employed a mixed-method approach, combining a quasi-experimental design with qualitative exploration to capture not only the improvement in students' writing but also their learning experiences. The quantitative part applied a Non-Equivalent Control Group Design, where one class received deep learning-based peer teaching and another class received conventional peer teaching. This design enabled a comparative analysis of the two approaches in enhancing writing skills.

Research Target/Subject

The research targeted approximately 120 seventh-grade students at SMP N 4 Purworejo. Two classes were selected through purposive random sampling, with each class consisting of 30 students. The selection process ensured that the groups were representative and suitable for the intervention based on their baseline academic abilities.

Research Procedure

Before the intervention, a needs assessment was conducted, and the instruments were validated with experts to ensure the research's reliability. The intervention lasted for 4 to 6 sessions, during which peer teaching activities were integrated with deep learning principles. These sessions aimed to help students analyze and develop descriptive texts more meaningfully by applying the deep learning approach to their peer interactions.

Instruments, and Data Collection Techniques

Data were collected through multiple methods: pre and post-tests, student questionnaires, and interviews with teachers. The students' writing performance was assessed using an analytic rubric that focused on content clarity, organization, vocabulary, and sentence structure. These tools provided both qualitative and quantitative insights into the effectiveness of the peer teaching interventions.

Data Analysis Technique

The quantitative data were analyzed using normality and homogeneity tests, t-tests, and N-Gain to identify learning gains between the two groups. The qualitative data, derived from interviews and questionnaires, were analyzed using content analysis. To ensure the credibility and accuracy of interpretations, the qualitative data were further validated through triangulation, member checking, and an audit trail.

RESULTS AND DISCUSSION

This research was conducted at State Junior High School 4 Purworejo, with 60 seventh-grade students divided into two classes: class VII A as the experimental class and class VII B as the control class. The experimental class was treated with a deep learning-based peer teaching model, while the control class underwent conventional learning using lectures and individual assignments. The primary research instruments were a descriptive text writing test used for the pretest and posttest, as well as a questionnaire assessing student responses to the implementation of the learning model. Data were analyzed using a t-test to determine differences in learning outcomes between the two classes.

The following table presents the research data, which relates to the pretest and posttest results.

Table 1. Result Pretest and Posttest

Group	Average Pretest	Average Posttest	Difference
Experiment	68,3	83,4	+15,1
Control	67,9	74,2	+6,3

Note: Both groups had nearly the same pretest average. However, the experimental group showed a higher improvement after treatment.

Statistical Test Results: T = 3,215 Df = 58 Sig.(2-tailed) = 0,003

Conclusion: There was a significant difference between the two groups ($p<0.05$). This means that the deep learning-based peer teaching model effectively improved descriptive text writing skills.

Table 2. Results of Student Perception Questionnaire (Experimental Group)

Statements	Agree (%)	Don't Agree (%)
The peer teaching model helped me understand the material more deeply.	87	13
I feel more confident when writing because I discuss it with friends.	81	19
I am more active and motivated during learning.	90	10
I feel that learning activities have become more enjoyable.	93	7

Based on the pretest and posttest data, as well as the questionnaire and interviews, several important points were identified that can be discussed as follows:

a. Improved Writing Skills in the Experimental Group

Quantitative results showed a significant increase in the posttest scores of the experimental group. The average posttest score for students in the experimental group was 83.4, an increase of 15.1 points from the pretest score of 68.3. Meanwhile, the control group only saw an increase from 67.9 to 74.2, an increase of only about 6.3 points. The results of the statistical test using an independent sample t-test showed a significance value of 0.003 ($p < 0.05$), indicating a significant difference between the learning outcomes of the two groups. This indicates that the deep learning-based peer teaching approach was more effective than conventional methods in improving students' descriptive writing skills. This improvement can be attributed to the characteristics of deep learning, which emphasizes in-depth understanding, critical reflection, and active engagement in the learning process. With the peer teaching model, students are not only recipients of information but also act as teachers for their peers, encouraging them to better understand the material and develop communication skills.

After treatment, posttest results showed improvement in both groups, but the experimental group's improvement was significantly higher. The experimental group's score increased to 83.4, while the control group's score was only 74.2. The difference in improvement of 15.1 points in the experimental group compared to 6.3 points in the control group indicates that deep learning-based peer teaching significantly improved students' writing skills. To determine the level of effectiveness of improving learning outcomes, the N-Gain calculation is used (Hake, 1998):

$$\text{N-Gain} = \frac{(\text{Posttest} - \text{Pretest})}{(100 - \text{Pretest})}$$

$$\text{Experiment group} = \frac{83{,}4 - 68{,}3}{100 - 68{,}3} = \frac{15{,}1}{31{,}7} = 0{,}48$$ its mean medium categories (effective)

$$\text{Control group} = \frac{74{,}2 - 67{,}9}{} = \frac{6{,}3}{} = 0{,}20$$ its mean low categories (less effective)

Thus, the deep learning-based peer teaching model is proven to be more effective than conventional learning in improving students' descriptive text writing skills. To determine whether the difference in learning outcomes between the two groups was statistically significant, an independent t-test was conducted on the posttest scores. The hypotheses tested were:

H_0 (null): There is no significant difference between the learning outcomes of the experimental and control groups.

H_1 (alternative): There is a significant difference between the learning outcomes of the experimental and control groups.

Based on the analysis ($p < 0.05$), the calculated t value is greater than the table t value, so H_0 is rejected and H_1 is accepted. This means there is a significant difference between the learning outcomes of students taught with deep learning-based peer teaching and those taught conventionally. Therefore, the improvement in writing skills in the experimental group was not coincidental, but rather a direct result of the implementation of this learning model.

The results of this study support Vygotsky's (1978) theory on the Zone of Proximal Development (ZPD), which states that learning is more effective when students receive support from peers or others with greater competence. Furthermore, these findings align with research by Gaffar, Fadilah, and Nopita (2024) and Kim and Choi (2023) which showed that collaborative and peer-based learning can improve students' higher-order thinking skills and academic achievement. Meanwhile, conventional teacher-centered learning in the control group led to students' tendency to be passive. They received information without in-depth exploration or reflection, resulting in relatively low improvement in their writing skills.

b. Student Perceptions of the Learning Model

Based on the post implementation questionnaire administered to students in the experimental group, their perceptions of the deep learning based peer teaching model showed consistently positive patterns across several measured aspects. Specifically, 87% of students reported improved understanding of descriptive text writing, 81% felt more confident during writing tasks, 90% indicated increased motivation, and 84% agreed that the classroom atmosphere became more supportive and engaging. These responses suggest that the model effectively fostered cognitive engagement and social interaction aligned with principles of collaborative learning and self efficacy development. Nevertheless, the overwhelmingly positive results should be interpreted cautiously, as self reported data may be influenced by social desirability bias or limited variability in the Likert scale responses. Even so, the convergence of high percentages across multiple dimensions strengthens the indication that students perceived meaningful academic and affective benefits from the learning approach.

A total of 87% of students agreed that the peer teaching model helped them understand the material more deeply, while only 13% of students disagreed. This high percentage in the agree category indicates that learning activities involving peers can strengthen students' understanding of the concepts and content of descriptive text writing materials. In the peer teaching process, students who act as peer tutors try to explain the material to their friends, while other students can learn through explanations delivered in simpler and easier-to-understand language. This process is in line with the principles of deep learning, which encourage students to think more deeply, connect concepts, and construct knowledge meaningfully. Furthermore, student interaction allows for clarification of unfamiliar concepts and enriches students' perspectives on the topics discussed. Thus, the peer teaching model has proven effective in increasing students' depth of understanding of writing materials.

Any 81% of students agreed that they felt more confident writing because of discussions with peers, while 19% disagreed. This data indicates that through collaborative learning activities, students receive social and emotional support from their peers, which ultimately boosts their self-confidence. Discussions between students create a safe and supportive environment for sharing ideas, correcting errors, and providing feedback without fear of teacher judgment. This increased self-confidence is a key indicator of the success of deep learning-based learning models, as students become more confident in expressing themselves and attempting to put their ideas into writing. Thus, the peer teaching model impacts not only the cognitive aspect but also the affective aspect of students, particularly in building confidence in their own abilities.

The third statement shows that 90% of students agreed that they became more active and motivated during the learning process, with only 10% disagreeing. This percentage indicates a significant increase in student participation and enthusiasm in the learning process. Through peer teaching, each student plays an active role, both as a provider and recipient of information. Students who act as peer tutors are encouraged to understand the material better so they can teach their peers, while other students are motivated to participate diligently in the activities so they can contribute to the group. This situation creates a dynamic, interactive, and non-monotonous learning environment, unlike conventional learning, which tends to be teacher-centered. With increased activeness and motivation, the learning process becomes more meaningful and sustainable, in keeping with the characteristics of deep learning, which emphasizes students' intellectual and emotional engagement.

The final statement received the highest response rate, with 93% of students agreeing that learning activities were more enjoyable with the peer teaching model, while only 7% disagreed. This data confirms that the collaborative approach among students successfully creates a positive, warm, and energetic classroom atmosphere. The sense of togetherness, the opportunity to help each other, and the relaxed atmosphere make students enjoy the learning process more. Peer teaching activities provide variety in learning, preventing students from feeling bored or stressed. They feel morefree to ask questions, discuss topics, and express their opinions without fear of being wrong. This enjoyable learning environment directly contributes to improved learning outcomes and student engagement in descriptive writing.

Overall, the questionnaire results showed that the implementation of the deep learning-based peer teaching model received a very positive response from students. The high percentage of agreement (between 81% and 93%) indicates that this model is able to improve students' understanding of the material on writing descriptive texts, build students' confidence in writing through interactions with peers, increase student engagement and motivation in learning, create a fun and collaborative learning environment. Thus, it can be concluded that the deep learning-based peer teaching model is effective in improving the quality of the process and learning outcomes of writing descriptive texts at State Junior High School 4 Purworejo, both from a cognitive, affective, and social perspective.

CONCLUSION

Based on the research results and discussions, it can be concluded that the deep learning-based peer teaching model has proven effective in improving students' descriptive writing skills. This is evidenced by a significant increase in posttest scores in the experimental group compared to the control group, as well as statistical test results showing a quantitatively meaningful difference. Students responded positively to the implementation of this learning model. They found it easier to understand the material, were more confident when writing, were more active, and were more motivated in the learning process. This model is relevant for junior high school students because it aligns with their cognitive and social development needs and encourages active engagement, critical thinking, and collaborative learning. Thus, the deep learning-based peer teaching model can be recommended as an alternative innovative and effective writing learning strategy at the junior high school level, especially in teaching descriptive texts.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project Administration; Validation.
Author 2: Conceptualization; Data curation; Investigation.
Author 3: Writing Review and Editing
Author 4: Research data collector

Author 5: Research data collector

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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