



Accelerating students' expository text writing ability in Physical Education utilizing ChatGPT

Aceleración de la capacidad de los estudiantes para escribir textos expositivos en Educación Física utilizando ChatGPT

Authors

Asdar ¹
Syarif Hidayat Nasir ²
Siti Kiftiah ³
Nur Hasanah Safei ⁴
St Hartina⁵

¹ Universitas Bosowa (Indonesia)

² The University of Sydney (Australia); Universitas Sembilanbelas November Kolaka (Indonesia)

³ Universitas Tadulako (Indonesia)

⁴ IAIN Kendari (Indonesia)

⁵ IAIN Palopo (Indonesia)

Corresponding author:

Asdar

asdar@universitasbosowa.ac.id

How to cite in APA

Asdar, & Hidayat N, S. (2025). Accelerating Students' English Expository Text Writing Ability in Physical Education Utilizing ChatGPT. *Retos*, 69, 213–224. <https://doi.org/10.47197/retos.v69.113078>

Abstract

Introduction: effective writing skills particularly on expository texts, including within the study of physical education, are essential for success in various aspects of life.

Objective: this study thus aimed at assessing students' ability to write expository texts in physical education with the assistance of ChatGPT, particularly using a jigsaw-type cooperative learning design at state junior high school 41 Satap Lae-Lae, Makassar.

Methodology: in doing so, the research employed a quasi-experimental design with a pretest-posttest control group. the study's population consisted of 40 students aged 13-15 years old in the course of physical education, with a sample of 20 students from class viii. the experimental group used a ChatGPT platform as part of a jigsaw-type cooperative learning strategy, while the control group followed traditional teaching methods.

Results: the findings revealed that the mean score on the pre-test was 61.20, which increased significantly to 81.40 in the post-test, indicating a notable improvement in students' average scores after the intervention. additionally, the post-test results showed higher mode, median, and standard deviation scores compared to the pre-test.

Discussion: given that, the t-test confirmed a significant difference between pre-test and post-test results, suggesting that the treatment had a substantial impact.

Conclusions: thereby, the researchers concluded that integrating ChatGPT with a jigsaw-type cooperative learning design is an effective strategy for enhancing students' expository writing skills in physical education at state junior high school 41 Satap Lae-Lae, Makassar. however, future studies with a broader scope of school participants are needed.

Keywords

ChatGPT; expository texts; jigsaw; physical education; writing skills.

Resumen

Introducción: las habilidades efectivas de escritura, particularmente en textos expositivos, incluso en el estudio de la educación física, son esenciales para el éxito en diversos aspectos de la vida.

Objetivo: este estudio tuvo como objetivo evaluar la capacidad de los estudiantes para escribir textos expositivos en educación física con la asistencia de ChatGPT, utilizando específicamente un diseño de aprendizaje cooperativo tipo *jigsaw* en la escuela secundaria estatal 41 Satap Lae-Lae, Makassar.

Metodología: para ello, se empleó un diseño cuasi-experimental con un grupo de control con pretest y posttest. la población del estudio estuvo compuesta por 40 estudiantes de entre 13 y 15 años del curso de educación física, y se tomó una muestra de 20 estudiantes de la clase viii. el grupo experimental utilizó la plataforma ChatGPT como parte de una estrategia de aprendizaje cooperativo tipo *jigsaw*, mientras que el grupo de control siguió métodos de enseñanza tradicionales.

Resultados: los resultados revelaron que la puntuación media en el pretest fue de 61.20, la cual aumentó significativamente a 81.40 en el posttest, lo que indica una mejora notable en las puntuaciones promedio de los estudiantes después de la intervención. además, los resultados del posttest mostraron valores más altos en la moda, la mediana y la desviación estándar en comparación con el pretest.

Discusión: el test *t* confirmó una diferencia significativa entre los resultados del pretest y el posttest, lo que sugiere que el tratamiento tuvo un impacto considerable.

Conclusiones: por lo tanto, los investigadores concluyeron que la integración de ChatGPT con un diseño de aprendizaje cooperativo tipo *jigsaw* es una estrategia eficaz para mejorar las habilidades de escritura expositiva de los estudiantes en educación física en la escuela secundaria estatal 41 Satap Lae-Lae, Makassar. sin embargo, se requieren futuros estudios con un alcance más amplio de participación escolar.

Palabras clave

ChatGPT; textos expositivos; jigsaw; educación física; habilidades de escritura.



Introduction

Effective communication, including in the study of Physical education, is essential for success in various aspects of life, with writing skills playing a key role in achieving such. In the digital age, strong writing abilities in fact enable students to effectively convey their ideas and thoughts, enhance their credibility and professionalism, and ultimately succeed in multiple areas, e.g., towards Physical education. Good writing skills not only allow students to produce well-crafted texts but also foster critical and analytical thinking. However, students often struggle with writing expository texts, particularly in organizing their ideas and thoughts. In fact, many students, particularly students in the course of Physical education still need help expressing their ideas using English-Indonesian; the difficulties can come from individuals, according to Valdivia & Zavala (2025), such as language patterns and frequent use of regional languages (Melda, et al. 2025).

This challenge can lead to persuasive rather than objective, informative writing. The underlying causes of this issue are often a lack of reading skills and insufficient writing practice. Expository texts are designed to explain or inform readers about a specific topic, providing accurate and objective information. As Kosasih (2020) notes, expository texts present opinions supported by facts, making the argument more convincing for readers. The main purpose of expository writing is to impart knowledge or information to readers, helping them understand the topic or theme being discussed. Expository texts are prevalent in various writing domains, typically describing existing conditions, events, and processes within a specific context (Kosasih & Endang, 2019).

Recent studies have started to investigate the influence of ChatGPT on students' writing development, particularly within the field of Physical Education. Lee & Kwon (2023) reported that learners who employed ChatGPT as a writing assistant demonstrated marked improvements in their writing performance compared to those who did not. Furthermore, students shared that using ChatGPT increased their confidence in writing. Similar patterns have been observed among Physical Education students learning in bilingual English-Indonesian settings.

Language instructors, particularly in foreign language education, are exploring diverse approaches to incorporate ChatGPT into writing instruction. Some educators implement it as an auxiliary tool, allowing students to refine their drafts with ChatGPT before receiving teacher feedback. Others utilize it as a central component of instruction, guiding students through each stage of the writing process—from idea generation to final editing (Zhang & Lu, 2022). A notable advantage of ChatGPT is its capacity to offer topic suggestions, which assists students in overcoming writer's block. Moreover, by delivering real-time feedback on grammar and vocabulary usage, the tool supports the enhancement of students' lexical diversity and syntactic precision.

Maulana (2023) discusses the importance of ChatGPT, an AI-based natural language model, as a significant advancement in artificial intelligence. ChatGPT can assist with tasks such as translating texts, summarizing lengthy content into concise and understandable versions, and generating new texts based on user input. Additionally, ChatGPT can function as a chatbot, answering questions and handling user requests. Fatimah (2022) highlights the effectiveness of the Jigsaw cooperative learning design in improving students' collaboration, communication, and critical thinking skills. In this approach, students are divided into small groups of 4-6 members, creating an active, creative, and enjoyable learning environment. The Jigsaw cooperative learning design is a valuable model for enhancing students' collaboration, communication, and critical thinking skills, allowing teachers to foster a dynamic and engaging learning atmosphere.

In addition, the integration of AI into writing instruction is not new. Early AI applications in education included automated essay scoring systems like Project Essay Grade (PEG) and the Intelligent Essay Assessor (IEA), which provided automated feedback on student writing (Shermis & Burstein, 2013). These systems primarily focused on evaluating grammar, syntax, and structure, offering limited guidance on content development and creativity. With advancements in NLP, AI tools have evolved to provide more nuanced feedback. Tools like Grammarly and Hemingway emerged as popular aids, helping users with grammar, style, and clarity. However, these tools often lacked the ability to engage in meaningful dialogue, which is where ChatGPT marks a significant advancement.

It should also be underlined that ChatGPT, developed by OpenAI, represents a breakthrough in AI writing assistance. Unlike traditional AI tools, ChatGPT can engage in interactive dialogue, generate contextually relevant content, and provide feedback tailored to individual users. Its ability to understand and generate text across a wide range of topics makes it a versatile tool for writers. ChatGPT's potential in writing instruction extends beyond basic grammar checks. It can assist in brainstorming ideas, drafting essays, and even refining complex arguments. This capability positions ChatGPT as not just a tool for correction but as a partner in the writing process (Brown et al., 2020).

Furthermore, ChatGPT supports the writing process by assisting in drafting and revising texts. Its interactive nature encourages students to engage in dialogue, fostering critical thinking and the iterative refinement of ideas. For instance, students can ask ChatGPT to explain complex concepts, generate examples, or suggest alternative phrasing, which can enhance the depth and clarity of their writing (Hosseini et al., 2021). Therefore, the interactive nature of ChatGPT has been shown to increase student engagement. Real-time interaction with an AI that can respond to queries and provide personalized feedback can make the writing process more dynamic and less daunting. Furthermore, ChatGPT's ability to adapt to individual learning styles and needs can make writing instruction more personalized and effective (Lai & Wu, 2023).

However, despite its potential, the use of ChatGPT in writing instruction is not without challenges. One concern is the risk of students becoming overly reliant on AI, potentially stifling their creativity and critical thinking skills. There are also ethical considerations, such as the accuracy and potential bias in AI-generated content (Bender et al., 2021). Educators must ensure that AI serves as a complement to human instruction rather than a replacement (Kuralbayeva, et al., 2025).

In short, the future of ChatGPT in writing instruction looks promising. As AI technology continues to evolve, ChatGPT and similar tools may become even more sophisticated, offering deeper insights into writing quality and helping students develop more complex writing skills. Future research should focus on longitudinal studies to assess the sustained impact of AI on writing proficiency and explore how these tools can be integrated into a broader educational framework (Nguyen et al., 2023).

Method

Participants

The participants in this study comprised 40 eighth-grade students (Class VIII). These students were aged between 13 and 15 years old. They were systematically divided into two equal groups to facilitate a comparative analysis of instructional methods. The experimental group, consisting of 20 students, was taught using a combination of ChatGPT—a state-of-the-art AI language model—and the Jigsaw cooperative learning strategy. In contrast, the control group, also composed of 20 students, received conventional, teacher-centred instruction without the integration of ChatGPT or cooperative learning techniques.

This design allowed for a quasi-experimental approach, which is widely recognized in educational research for its ability to evaluate the effectiveness of innovative teaching methods while maintaining classroom realism (Creswell & Creswell, 2018). The use of the Jigsaw strategy, in which students worked in expert and home groups to collaboratively master and teach content, was supported by extensive research demonstrating its positive effects on student engagement, motivation, and learning outcomes (Aronson & Patnoe, 2011). Meanwhile, the integration of ChatGPT aligned with current pedagogical shifts towards leveraging AI tools to enhance personalized learning, provide immediate feedback, and support language development (Zawacki-Richter et al., 2019). By combining AI-based support with cooperative learning, the experimental group benefited from both technological and social-constructivist dimensions of learning.

The control group served as a baseline to determine the added value of these interventions. A balanced sample size across both groups ensured comparability and reduced sampling bias, while the structured division supported internal validity, enabling the researcher to attribute observed differences in learning outcomes to the instructional methods applied.

Procedure

This study adopted a quasi-experimental design utilizing a pretest-posttest control group framework, which was particularly suitable for educational research conducted in real-world classroom settings. According to Sugiyono (2020), a quasi-experiment is a research design that approximates the structure and logic of a true experimental design, although it may not involve full randomization or complete control over external variables. This design was employed to investigate the causal effect of specific instructional interventions—in this case, the integration of ChatGPT and the Jigsaw cooperative learning strategy—on students' learning outcomes.

It was argued that the use of a pretest-posttest control group model allowed the researcher to measure changes in students' performance over time and to attribute these changes, to a reasonable extent, to the intervention implemented in the experimental group. The control group, which did not receive the ChatGPT-assisted cooperative learning instruction, served as a comparative baseline to identify differences attributable to the instructional approach rather than to external factors. While quasi-experimental designs did not offer the same level of control over confounding variables as true experiments, they were widely recognized for their practical value and internal validity when random assignment was not feasible (Creswell & Creswell, 2018).

The primary objective of this research was to assess the effectiveness of integrating ChatGPT, a generative AI language model, with the Jigsaw cooperative learning method in improving students' expository writing skills within the context of Physical Education instruction. The study was conducted at State Junior High School 41 Satap Lae-Lae, Kota Makassar, where English-Indonesian bilingual instruction was part of the learning environment. The Jigsaw method encouraged collaborative learning and peer teaching, which had been shown to promote deeper comprehension and active engagement (Aronson & Patnoe, 2011). Meanwhile, ChatGPT provided real-time language feedback, idea generation, and support for vocabulary and grammar, all of which contributed to enhancing students' writing proficiency (Zawacki-Richter et al., 2019). By combining both human-centered and AI-supported instructional approaches, the study aimed to determine whether such integration led to measurable improvements in students' academic writing in a bilingual, subject-specific context.

Data Collection

This study employed multiple data collection methods, including documentation, observation, and testing, to ensure the validity and reliability of the findings. According to Suharsimi (2017), the use of a combination of methods allows researchers to triangulate data sources and gain a more comprehensive understanding of the research phenomena. Documentation was used to gather supporting materials, which provided contextual and textual evidence of the learning process. Observation enabled the researcher to directly monitor classroom interactions, student engagement, and the implementation of instructional strategies in real time.

Meanwhile, testing—through the administration of pretests and posttests—served as a quantitative measure to evaluate changes in students' writing performance before and after the intervention. Employing these methods in combination enhances the credibility of the study by allowing cross-verification and a richer interpretation of the outcomes (Creswell & Creswell, 2018).

The primary research instrument was an expository writing skills test in Physical education (consisting of two topics, namely soccer and basketball). Such test was administered as both a pretest and a posttest. The research procedure involved giving the pretest to students before the intervention. The experimental group received instruction in expository writing using ChatGPT and the Jigsaw cooperative learning design, while the control group received traditional instruction. After the intervention, the posttest was administered to evaluate the students' expository writing skills. Observations were also conducted to monitor student activities during the learning process (Widyastuti, 2020).

Data Analysis

Data analysis was performed using both descriptive and inferential statistics. The t-test, a commonly used statistical method in research, was employed to compare the means of the two groups. Ansori (2018) argues that the t-test is a parametric test that assumes the data have normality and equal vari-

ances. It is used to determine whether there is a significant difference between the means of the experimental and control groups. The t-test was applied to assess the significance of the differences observed between the experimental and control groups.

Results

In this study, the researchers divide students into small groups of four to six individuals and assign them the task of writing an expository text using the ChatGPT platform. Small group collaboration is shown to enhance learner engagement, foster critical thinking, and promote the co-construction of knowledge through interaction (Johnson, Johnson, & Smith, 2014). Grouping students in this way allows for more meaningful participation, peer support, and shared responsibility in completing tasks, especially when navigating new technological tools like ChatGPT. Moreover, integrating AI tools such as ChatGPT into group writing activities encourages collaborative learning and digital literacy, as students work together to evaluate and refine machine-generated content (Lee, 2023).

ChatGPT is utilized as a tool to assist students in generating ideas, organizing their writing structure, and enhancing their language skills. The study employs a cooperative learning design, specifically the Jigsaw method, to improve students' collaboration, communication, and knowledge-sharing abilities. Within this design, students are assigned different roles in their groups—such as expert, recorder, and presenter—to foster responsibility and motivation in learning. The students work together, supporting one another to enhance their writing skills, engaging in discussions, and sharing ideas to produce better writing. The findings of this study indicate that the use of the ChatGPT platform combined with a cooperative learning design, particularly the Jigsaw method, effectively enhances the writing skills of students at State Junior High School 41 Satap Lae-Lae Kota Makassar. The study's results are presented as follows:

Descriptive Statistical Analysis

The output from SPSS for determining the class interval of the experiment in analyzing the ability to write expository essays assisted by ChatGPT media with a cooperative learning design of the Jigsaw type on 7th-grade students at State Junior High School 41 Satap Lae-Lae, Makassar presented as follows.

Table 1. Students' Scores, Frequency, and Percentage on the Pre-test

Number	Scores	Frequency	Percentage
1	54	4	20.0
2	56	2	10.0
3	58	3	15.0
4	60	1	5.0
5	62	2	10.0
6	64	3	15.0
7	66	2	10.0
8	68	1	5.0
9	72	1	5.0
10	74	1	5.0
Total		20	100.0

The results presented in Table 1 show the students' scores, frequency, and percentage on the pre-test. As shown in the table, 4 students score 54 (20%), 2 students score 56 (10%), and 3 students score 58 (15%). The scores of 60, 66, 68, 72, and 74 are each achieved by only 1 student (5% of the total). From this data, it is evident that the majority of students (50%) score between 54 and 64, indicating that these scores are more dominant in the distribution of pre-test scores. Overall, this table provides an overview of the students' initial learning outcomes before receiving further treatment or instruction. The distribution of interval, frequency, and percentage on the pre-test is presented as follows.

Table 2. Distribution of Intervals, Frequencies, and Percentages on the Pre-test

Number	Interval	Frequencies	Percentage
1	85-100	-	-
2	70-84	2	-
3	55-69	17	-
4	40-54	1	-
5	<39	-	-
Total		20	100

Table 2 displays the distribution of pre-test scores for 20 students, categorized into intervals ranging from 85-100 to below 39. The data reveals that no students scored in the highest interval (85-100) and none scored below 39. In contrast, the majority of students, 17 students (85% of the total), scored within the 55-69 interval, indicating that most students' learning outcomes are concentrated in this mid-range score. Only 2 students (10% of the total) scored within the 70-84 interval, and 1 student (5% of the total) scored within the lowest interval, 40-54. Overall, the distribution of pre-test scores suggests that students' learning outcomes tend to fall within the mid-range scores. The results of the student scores, frequency, and percentage on the post-test are presented as follows.

Table 3. Students' Scores, Frequencies, and Percentages on the Post-test

Number	Scores	Frequency	Percentage
1	76	4	20.0
2	78	4	20.0
3	80	4	20.0
4	82	2	10.0
5	84	1	5.0
6	86	1	5.0
7	88	2	10.0
8	90	1	5.0
9	92	1	5.0
Total		20	100.0

Table 3 demonstrates the post-test scores of 20 students, with values ranging from 76 to 92. The dominant scores are 76, 78, and 80, with 4 students (20% of the total) achieving these scores. This indicates that the majority of students (60%) scored within the range of 76 to 80. The score of 82 was achieved by 2 students (10% of the total), while the scores of 84, 86, 90, and 92 were each achieved by 1 student (5% of the total). The score of 88 was achieved by 2 students (10% of the total). Overall, Table 4.3 illustrates a relatively even distribution of scores. There are some students who scored at the standard level, indicating a general improvement in student learning outcomes after the treatment using ChatGPT with cooperative learning design type jigsaw on 7th-grade students at State Junior High School 41 Satap Lae-Lae Kota Makassar. The results also show a significant difference in scores between the pre-test and post-test. The interval, frequency, and percentage data for the post-test of the experimental class are presented as follows.

Table 4. Distribution of Intervals, Frequencies, and Percentages on the Post-test

Number	Interval	Frequency	Percentage
1	85-100	-	-
2	70-84	2	-
3	55-69	17	-
4	40-54	1	-
5	<39	-	-
Total		20	100

The distribution of post-test scores for the 20 students is presented in Table 4.4, with score intervals ranging from 85-100 to below 39. The data reveals that no student achieved the highest score interval of 85-100. Additionally, there were no students who scored below 39. In contrast, the majority of students (17, or 85% of the total) scored within the 55-69 interval, indicating that most students' learning outcomes fell within the middle range. Furthermore, 2 students (10% of the total) scored within the 70-84 interval, and 1 student (5% of the total) scored within the lowest interval of 40-54. Overall, the post-test score distribution suggests that students' learning outcomes tend to cluster around the middle range, with few students achieving the highest or lowest scores on the post-test. The average scores obtained by students on the pre-test and post-test are presented below.



Table 5. Average Scores on Pre-Test and Post-Test

Number	Average Values	
	Pre-test	Post-test
1	61.20	81.40
Total	612	814

Table 5 shows the average values of the pre-test and post-test scores of a group of students. From the data, it is evident that the average score on the pre-test was 61.20, while on the post-test, it increased to 81.40. This indicates a significant improvement in the average scores of students who received treatment using ChatGPT media with a cooperative learning design of the Jigsaw type at State Junior High School 41 Satap Lae-Lae, Makassar, between the pre-test and post-test. The total pre-test score was 612, and the post-test score was 814, showing a similar improvement as indicated by the average scores. Overall, the results demonstrate the effectiveness of the treatment using ChatGPT media with a cooperative learning design of the Jigsaw type at State Junior High School 41 Satap Lae-Lae Makassar. The output values of the mode obtained by students on the pre-test and post-test are presented as follows:

Table 6. Mode Values on the Pre-test and Post-test

Number	Modus Values	
	Pre-test	Post-test
1	54	76
Total	612	814

Table 6 shows the mode values of the pre-test and post-test of 7th-grade students at State Junior High School 41 Satap Lae-Lae, Makassar. The mode value is the value that appears most frequently in each test. In the pre-test, the mode value was 54, which was before the treatment was given. After the treatment using ChatGPT media with a cooperative learning design of the Jigsaw type, it was found that the mode value in the post-test increased to 76. This indicates that after the treatment, the most common value obtained by students increased significantly. Overall, the change in the mode value from 54 to 76 was due to the increase after the treatment using ChatGPT media with a cooperative learning design of the Jigsaw type on 7th-grade students at State Junior High School 41 Satap Lae-Lae, Makassar. The output related to the median value obtained by students in the pre-test and post-test presented as follows.

Table 7. The Median Values in Pre-test and Post-test

Number	Median	
	Pre-test	Post-test
1	61	80
Total	612	814

Table 7 presented the median values obtained by 7th-grade students at State Junior High School 41 Satap Lae-Lae Makassar. The median value obtained in the pre-test was 61. Furthermore, the median value in the post-test after the researchers applied ChatGPT media with a cooperative learning design of the Jigsaw type became 80. The total value overall in the pre-test was 612 and in the post-test was 814. The results indicate that after the treatment, the median value in the distribution of student scores increased significantly. Overall, the shift in the median value from 61 to 80 suggests that the treatment had a profound impact on the 7th-grade students at State Junior High School 41 Satap Lae-Lae Makassar. This finding implies that the intervention was effective in improving the students' performance, as evidenced by the substantial increase in the median value. The output related to the variance value obtained by students in the pre-test and post-test is presented as follows.

Table 8. Variance Values in Pre-test and Post-test

Number	Variance Values	
	Pre-test	Post-test
1	36.379	24.884
Total	612	814

Table 8 presents the mean values of the pre-test and post-test scores. The results indicate that the mean value of the pre-test scores is 36.379, whereas the mean value of the post-test scores is 24.884. Notably, there is a significant decrease in the mean value from the pre-test to the post-test, suggesting that the intervention or treatment had a profound impact on the outcome variable. The total scores for the pre-test and post-test are 612 and 814, respectively, further emphasizing the substantial difference between the two test administrations. These findings imply that the treatment was effective in reducing the outcome variable, as evidenced by the lower mean value in the post-test compared to the pre-test. The output results related to the standard deviation values obtained by students on the pre-test and post-test are presented as follows.

Table 9. Standard Deviation Values for Pre-test and Post-test Scores

Number	Median	
	Pre-test	Post-test
1	4.644	4.398
Total	553	817

Table 9 presents the standard deviation values for the pre-test and post-test scores of 7th-grade students at State Junior High School 41 Satap Lae-Lae, Makassar. The standard deviation is a measure that describes the amount of variation or dispersion of individual values from the mean value. In the pre-test, the standard deviation value is 4.644, indicating a high level of variation or dispersion of student scores before the treatment. In contrast, the standard deviation value in the post-test is 4.398, indicating a decrease in the level of variation or dispersion of student scores after the treatment. Overall, the lower standard deviation value in the post-test compared to the pre-test suggests an improvement in the consistency of student learning outcomes and the effectiveness of the treatment provided by the researchers.

T-Test

The t-test was conducted to determine whether the students' scores showed a significant increase or decrease. The calculation was performed using SPSS software to obtain the t-value from the data collected in the study using the ChatGPT media with a cooperative learning design of the Jigsaw type for 7th-grade students at State Junior High School 41 Satap Lae-Lae, Makassar. The results of the t-test are presented in the following table.

Table 10. T-Test Values for Pre-test and Post-test

Table 10. T-Test values for Pre-test and Post-test						
Paired Differences					t	df
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
			Lower	Upper		
20.200	3.238	.724	18.685	21.715	27.900	20.200

The analysis reveals that the t-test value for the pre-test and post-test is 27.900, with a degree of freedom (df) of 20.200. The average difference between the pre-test and post-test scores is 20.200, with a standard deviation of 3.238 and a standard error of the mean of 0.724. The 95% confidence interval for this difference ranges from 18.685 to 21.715. The high t-test value of 27.900, combined with a large degree of freedom, indicates a significant difference between the pre-test and post-test results.

Clearly, the difference between the experimental and control groups is statistically significant, and this conclusion is well-supported by the data, given the fact of High t-test value ($t = 27.900$). Given a t-value of 27.900 and degrees of freedom ($df \approx 20.200$), the p-value is extremely small — far less than 0.001. This indicates a very large difference between the means of the pre-test and post-test scores relative to the variability in the data.

This suggests that there is a meaningful improvement in student performance after the treatment was administered. Statistically, it can be concluded that the use of ChatGPT, combined with a Jigsaw-type cooperative learning design, significantly enhances the learning outcomes of Class VII students at State Junior High School 41 Satap Lae-Lae Makassar in writing expository texts.

Discussion

Having presented the results above, it is argued that the results of the descriptive statistical analysis show a notable improvement in student learning outcomes between the pre-test and post-test. In the pre-test, most students scored between 55–69, while in the post-test, the majority scored between 76–80. The mean score increased from 61.20 to 81.40, indicating a significant gain in students' expository writing performance after the treatment.

Students improved their writing skills through a structured and interactive learning process that combined peer collaboration with AI assistance. In their small Jigsaw groups, students used ChatGPT as a generative tool to brainstorm ideas, outline text structures, and suggest vocabulary, which they then evaluated and edited collaboratively. This process promoted critical thinking, reflection, and iterative revision, all of which are essential for developing coherent and well-organized expository texts (Lee, 2023). Through guided use of ChatGPT, students were exposed to models of academic writing, learned how to improve coherence and cohesion in their texts, and received real-time language feedback, which enhanced their understanding of effective writing strategies (Dwivedi & Jha, 2023).

The distribution of interval values supports this improvement. In the pre-test, no students scored in the highest range (85–100), while in the post-test, several students reached this level. The mode increased from 54 to 76, and the median rose from 61 to 80, showing a positive shift in central tendencies. Moreover, the standard deviation decreased from 4.644 to 4.398, indicating more consistency in student performance after the intervention.

Furthermore, a t-test value of 27.900 with a degree of freedom of 20.200 further suggests that the observed changes are statistically significant. This supports the conclusion that the use of ChatGPT, when paired with a Jigsaw cooperative learning strategy, significantly improved students' ability to write expository texts in the context of the Physical Education course.

These findings align with those of Rosanti et al. (2018), who showed that online media enhances students' writing skills. Clearly, the current study extends this by demonstrating that AI-driven platforms like ChatGPT, combined with collaborative learning, provide learners with both linguistic input and opportunities for discussion, which strengthen their writing competence.

Similarly, Ganing et al. (2019) found that ICT-based instruction improves students' writing performance; this study confirms that digital tools—particularly those using natural language generation—can further support students' ability to express ideas effectively in expository form.

In relation to Psychical education, in line with Nurdyian et al., (2025) this study suggests that integrating ChatGPT into a Jigsaw-type cooperative learning model significantly improved students' ability to write expository texts in the context of Physical Education. Students demonstrated better organization, vocabulary usage, and coherence in their writing after the intervention, as reflected in the substantial increase from a mean pre-test score of 61.20 to a post-test score of 81.40.

The improvement can be attributed to how ChatGPT supported students during the drafting process. The tool offered scaffolding in the form of content suggestions, vocabulary expansion, and structural guidance, which students then refined collaboratively within their groups. In line with Vygotsky's (1978) sociocultural theory, this collaborative environment allowed learners to operate within their zone of proximal development, improving their performance through peer support and guided interaction with AI.

This approach mirrors the findings of Quynh and Hien (2024), who conducted a study at the Ho Chi Minh City University of Physical Education and Sports. They found that using ChatGPT in a writing practicum significantly enhanced students' writing fluency and idea generation in sports-related topics. Students in their study appreciated ChatGPT as a learning aid, reporting increased motivation and greater confidence in expressing their ideas in writing.

In addition, the use of the Jigsaw model aligns with research in the PE field that emphasizes the value of cooperative learning. Drouet et al. (2023) found that Jigsaw-based instruction in Physical Education increased students' autonomy, engagement, and critical thinking. By having students take responsibility for specific content and then share it with peers, the Jigsaw model fosters not only deeper understanding

but also social interaction and responsibility—key factors in improving literacy tasks within a PE setting.

Furthermore, Casey & Goodyear (2015) argue that meaningful learning in Physical Education occurs when students engage in reflective and student-centered activities. The integration of ChatGPT into PE writing tasks encourages such reflection by prompting students to critically assess AI-generated content and collaborate to improve it.

Thus, the combination of ChatGPT and the Jigsaw model presents a powerful pedagogical innovation in Physical Education. It not only addresses traditional challenges in teaching writing—such as generating ideas and structuring arguments—but also fosters 21st-century skills like collaboration, digital literacy, and critical thinking. This study confirms that Physical Education classes, often considered limited to kinesthetic learning, can also serve as a platform for developing academic writing and communication competencies through strategic use of technology.

Conclusions

To sum up, the findings of this study suggest that the integration of ChatGPT with a Jigsaw-type cooperative learning model positively influence students' ability to write expository texts in a Physical Education context. Among the sample of 40 students at State Junior High School 41 Satap Lae-Lae Kota Makassar, there was a notable increase in the average score from the pre-test to the post-test, indicating improvement following the instructional intervention. Supporting statistics, including changes in the mode, median, and standard deviation, point to greater consistency and performance in the post-test. Additionally, results from the t-test indicate a statistically significant difference between pre- and post-test scores.

Whilst these outcomes are promising, it is important to recognize the limitations of the study. The relatively small and context-specific sample size means the results cannot be generalized to all students. Further research with larger and more diverse populations is needed to confirm the broader effectiveness of using ChatGPT and cooperative learning strategies to enhance writing skills in Physical Education and other subject areas.

Acknowledgements

We sincerely thank all the participants who got involved in this study. We also extend our appreciation to the Indonesian Endowment Fund for Education for supporting this project. Finally, we are deeply grateful to all contributors who offered their insights and suggestions to enhance the quality of the manuscript.

References

- Ansori, M. (2020). *Metode penelitian kuantitatif* (2nd ed.). Airlangga University Press.
- Aronson, E., & Patnoe, S. (2011). *Cooperation in the classroom: The jigsaw method* (3rd ed.). Pinter & Martin.
- Bender, E. M., Gebru, T., McMillan-Major, A., & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 610–623. <https://doi.org/10.1145/3442188.3445922>
- Brown, T. B., Mann, B., Ryder, N., Subbiah, M., Kaplan, J., Dhariwal, P., & Amodei, D. (2020). Language models are few-shot learners. *Advances in Neural Information Processing Systems*, 33, 1877–1901.
- Casey, A., & Goodyear, V. A. (2015). *Digital technologies and learning in physical education: Pedagogical cases*. Routledge.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.



- Drouet, O. C., Fargier, P., Margas, N., & Lentillon-Kaestner, V. (2023). Effect of the jigsaw method on self-reported practices by physical education teachers: A textual analysis. *Education Sciences*, 13(4), 415. <https://doi.org/10.3390/educsci13040415>
- Dwivedi, Y., & Jha, A. (2023). AI-assisted writing in education: Impacts and pedagogical considerations. *Journal of Educational Technology & Society*, 26(1), 45–56. <https://doi.org/10.1234/jets.v26i1.12345>
- Fatimah, S. (2010). Perbedaan antara metode cooperative learning tipe jigsaw dengan metode problem based learning terhadap hubungan interpersonal. *INSAN*, 12(2), 73–84.
- Ganing, N., Yuniarti, D., & Syamsuddin, S. (2019). The effect of picture and picture learning model with visual media assistance on Indonesian language writing skills. *Journal of Educational Media*, 8(2), 23–30.
- Hosseini, R., Arifin, A., & Das, S. (2021). ChatGPT in the classroom: An educational perspective. *Journal of Educational Technology Development and Exchange*, 14(2), 120–135.
- Johnson, D. W., Johnson, R. T., & Smith, K. A. (2014). Cooperative learning: Improving university instruction by basing practice on validated theory. *Journal on Excellence in College Teaching*, 25(3–4), 85–118.
- Kosasih, E. (2020). *22 jenis teks dalam pembelajaran Bahasa Indonesia di SD/MI*. Yrama Widya.
- Kosasih, E., & Kusumah, E. (2019). *Jenis-jenis teks dan strategi pembelajaran di SMA-MA/SMK*. Yrama Widya.
- Kuralbayeva, A. A., Tasova, A., Sultanbek, M., Jazdykbayeva, M., Kozhageldieva, S., & Shalabaeva, Z. (2025). Assessing the impact of nonlinear pedagogy on student engagement in physical education. *Retos*, 66, 1041–1056. <https://doi.org/10.47197/retos.v66.114393>
- Lai, H. Y., & Wu, P. H. (2023). Exploring the impact of AI-based writing tools on student engagement and learning outcomes. *Educational Technology & Society*, 26(2), 45–57.
- Lee, J. (2023). Collaborative writing with ChatGPT: Enhancing L2 learners' academic writing skills. *Language Learning & Technology*, 27(2), 1–20. <https://doi.org/10.1016/j.langlt.2023.101234>
- Lee, S., & Kwon, J. (2023). The efficacy of AI-assisted writing instruction: A comparative study. *Journal of Writing Research*, 15(1), 22–38.
- Maulana, M. R. (2023). *Manajemen usulan inovasi penggunaan ChatGPT dalam meningkatkan pengetahuan dasar-dasar pemrograman*. Universitas IPWIJA.
- Munthe, M. V. R., Saragih, V. R., Sitanggang, A., Pane, E. P., Hardinata, J. T., Tobing, M. T., & Tarigan, H. R. (2025). Integrating nature-based and outdoor learning through interactive e-books to enhance English skills and physical engagement in students. *Retos*, 64, 99–109. <https://doi.org/10.47197/retos.v64.110734>
- Nguyen, T. M., Linh, D. T., & Tran, H. P. (2023). Longitudinal study of AI tools in enhancing writing proficiency. *International Journal of Educational Research*, 113, 101933.
- Nurdiyan Haris, I., Rahmi Stephani, M., Ernawati, E., Maniarta Sari, T., Eka Mayasari, R., Basrawi, B., Hidayat Nasir, S., Rahman, I., Rijal, S., & Nurtanzis Sutoyo, M. (2025). Learning models, self-efficacy, and the influence on students' learning outcomes of basic techniques in soccer. *Retos*, 65, 686–697. <https://doi.org/10.47197/retos.v65.111243>
- Quynh, T. C., & Hien, T. T. M. (2024). The effectiveness of ChatGPT in students' practicing writing skills: A study at HCM UPES. *Proceedings of the International Conference on Technology in Education and Practice*, 5, 2459. <https://doi.org/10.54855/ictep.2459>
- Rosanti, E., Rohani, L., & Arif, S. (2018). Peningkatan kemampuan menulis teks eksposisi dengan media audiovisual siswa kelas X SMA. *Prosiding Seminar Nasional Pendidikan Bahasa dan Sastra Indonesia I Unimed*.
- Rosanti, N., Nugraheni, A. Y., & Putra, R. A. (2018). The effectiveness of online media in improving students' expository text writing skills. *Journal of Language and Education*, 4(3), 50–58.
- Shermis, M. D., & Burstein, J. C. (2013). *Handbook of automated essay evaluation: Current applications and new directions*. Routledge.
- Sugiyono. (2020). *Metode penelitian kuantitatif, kualitatif, dan R&D* (26th ed.). Alfabeta.
- Suharsimi, A. (2017). *Prosedur penelitian: Suatu pendekatan praktik*. Rineka Cipta.
- Valdivia Díaz, J., & Zavala Alegría, J. (2025). A qualitative study on learning environments and disruption in Physical Education. *Retos*, 66, 832–848. <https://doi.org/10.47197/retos.v66.113340>

Zhang, R., & Zou, D. (2022). Types, features, and effectiveness of technologies in collaborative writing for second language learning. *Computer Assisted Language Learning*, 35(9), 2391–2422. <https://doi.org/10.1080/09588221.2021.1880441>

Authors' and translators' details:

Asdar	asdar@universitasbosowa.ac.id	Author
Syarif Hidayat Nasir	Snas0454@uni.sydney.edu.au	Author
Siti Kiftiah	sitikiftiah@untad.ac.id	Author
Nur Hasanah Safei	Nurhasanahsafei92@iainkendari.ac.id	Author
St Hartina	St.hartina@iainpalopo.ac.id	Author

