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Comparative Analysis of Indonesian Language Learning Outcomes through PowerPoint and Picture Media on Fourth-Grade Students' Writing Ability

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ABSTRACT

This study aimed to analyze the comparative results of Indonesian language learning through the use of PowerPoint and picture media on the writing ability of fourth-grade students of State Elementary School 112 Parbangunan, Mandailing Natal Regency in the 2025–2026 academic year. The background of this study is the low writing ability of students due to the lack of variety of learning media used. Writing is a basic skill in learning Indonesian that needs to be developed early on because it is closely related to the ability to think, organize ideas, and communicate thoughts in writing. This study used a comparative quantitative approach with a nonequivalent control group design. The population of the study was all 40 fourth-grade students of SD Negeri 112 Parbangunan, divided into two groups: class IVA as the experimental group with PowerPoint media and class IVB as the control group with image media. The research instrument was a writing test given during the pretest and posttest. The data analysis technique used a normality test, homogeneity test, and t-test to determine significant differences between the two groups. The results showed that the average posttest score of students who learned with PowerPoint media was higher than that of f students who used image media. Based on the t-test, the t-count value was 2.27 with a t-table of 2.024 at a significance level of 0.05. Because t-count> t-table, there was a significant difference between the two media. Thus, it can be concluded that PowerPoint media is more effective than image media in improving students' writing skills.

Keywords: Play Method, Early Reading, Learning Strategy

I. INTRODUCTION

Education is a fundamental instrument for developing individuals capable of responding to the increasingly complex demands of contemporary life. In the Indonesian context, education is mandated to foster not only knowledge and skills but also faith, piety, noble character, and social responsibility. At the primary level, literacy—especially reading and writing—forms the foundation upon which subsequent learning is built. Without adequate literacy skills, students will struggle to access content across subject areas and participate meaningfully in social and civic life (Mukhlasin & Maragustam Siregar, 2025).

Among the four language skills—listening, speaking, reading, and writing—writing is often regarded as the most complex. Writing requires learners to generate ideas, organize them logically, choose appropriate vocabulary and grammatical structures, and present information cohesively and coherently. Unlike oral communication, which allows for immediate clarification, writing is a permanent record of thought that must be understandable without real-time interaction between the writer and reader. Consequently, writing is both a cognitive and metacognitive activity that demands sustained attention and self-regulation (Utomo et al., 2024).

At the primary school level, Indonesian language education seeks to cultivate these abilities from an early age. In grade IV, the curriculum expects students to produce simple descriptive and narrative texts, apply correct spelling and punctuation, and employ vocabulary suitable for the topic and audience. Despite these expectations, classroom practice frequently reveals that many students have difficulty expressing their ideas in written form. Common problems include limited vocabulary, weak sentence structure, poorly organized paragraphs, and a tendency to produce very short or incomplete texts. These challenges are often compounded by low motivation and anxiety about writing (Arezsya et al., 2025).

One important factor contributing to these difficulties is the limited variety and quality of instructional media employed by teachers. Traditional teaching in Indonesian language classes often relies heavily on teacher

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explanations and textbook-based exercises, with minimal use of visual or technology-enhanced materials. Such approaches may fail to capture students' interest, especially in an era in which children are increasingly exposed to visual and digital stimuli outside of school. When classroom instruction does not compete with or complement these experiences, students may become disengaged, leading to lower participation and weaker learning outcomes (Alehegn & Al Qudah, 2025).

Instructional media can offer a means of addressing these issues. By presenting content in more concrete and engaging forms, media can support students' understanding, stimulate their imagination, and reduce the cognitive load associated with abstract tasks such as writing. For example, visual media can provide shared reference points that help students generate ideas, while multimedia presentations can guide learners step-by-step through the writing process, highlighting elements such as topic sentences, supporting details, and concluding statements. In addition, media can create more interactive and student-centred learning environments, encouraging discussion, collaboration, and the active construction of knowledge (Triana et al., 2025).

Two types of media commonly used in Indonesian primary schools are PowerPoint and picture media. When combined with a laptop and projector, Powerpoint allows teachers to design multimedia slideshows that integrate text, images, diagrams, and simple animations. This can transform a conventional lecture into a more structured and visually rich experience. In the context of writing instruction, PowerPoint slides can present model texts, highlight important language features, and provide stepwise prompts that scaffold students' own compositions. The sequential nature of slides encourages teachers to think carefully about the progression of the lesson, which may support more coherent instruction (Yunus et al., 2025).

Picture media are more traditional but remain highly valuable, particularly in resource-limited settings. Carefully selected images can depict real-life situations, characters, settings, and events that inspire students' descriptive and narrative writing. When students observe and discuss pictures together, they activate prior knowledge, develop vocabulary, and build a shared understanding. Pictures can therefore function as concrete stimuli for idea generation and planning, especially for learners who struggle to think abstractly or have limited experiential backgrounds.

Despite the theoretical advantages of both media, questions remain about their relative effectiveness in improving primary students' writing ability in Indonesian language classes. Some studies suggest that multimedia presentations, such as PowerPoint, enhance motivation and conceptual understanding more than static visuals, especially when well designed. Other research highlights the strengths of simple picture media in stimulating creativity and imagination. In practice, teachers may prefer one medium over the other based on familiarity, availability of equipment, or perceived ease of use, rather than on empirical evidence (Simanjuntak & Selviana Napitupulu, 2026).

At SD Negeri 112 Parbangunan in Mandailing Natal Regency, such challenges are clearly visible. Preliminary observations indicated that many fourth-grade students experienced difficulty writing coherent and adequately developed texts. Teachers had informally experimented with both PowerPoint and picture-based activities; however, there was no systematic evaluation of which medium more effectively supported students' writing development. Moreover, decisions about media use were not grounded in data but were largely intuitive. This situation reflects a broader need for classroom-based research that examines the impact of different media on specific learning outcomes (Simanungkalit et al., 2026).

This study addresses this need by conducting a comparative analysis of Indonesian language learning outcomes through the use of PowerPoint and picture media in writing instruction for fourth-grade students. The research focuses on two main questions. The research focuses on two main questions: First, is there a significant difference in writing achievement between students taught using PowerPoint and those taught using picture media? Second, which of these media is more effective in improving writing ability, as reflected in post-test scores? (Resma et al., 2025)

Addressing these questions is important for both theoretical and practical reasons. Theoretically, the study contributes to the growing body of literature on media effectiveness in language education, particularly in the under-researched area of Indonesian primary writing instruction. Practically, the findings can inform teachers' and school leaders' decisions about resource allocation, lesson planning, and professional development. If one medium proves significantly more effective, schools may prioritize its use and support teachers in mastering relevant pedagogical strategies. Conversely, if both media are similarly effective, teachers might select based on contextual constraints and student preferences.

In addition, this study has implications for raising literacy levels in Indonesian primary schools more broadly. By demonstrating how relatively accessible media can be used to enhance writing instruction, this research provides a model that can be adapted and replicated in other schools with similar conditions. Ultimately,

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improving students' writing ability is integral to achieving the national goal of developing creative, independent, and responsible citizens capable of contributing to societal progress.

II. METHODS

A. *Research Design*

This study employed a comparative quantitative research design to identify differences in learning outcomes between two groups exposed to different instructional media. More specifically, a nonequivalent control group design was used. In this quasi-experimental design, intact classes were assigned to experimental and control conditions without random individual assignment, reflecting typical constraints in school-based research (Creswell, 2021).

Both groups were assessed before and after the intervention using equivalent writing tests. The experimental group received writing instruction using PowerPoint, whereas the control group received writing instruction using picture media. Comparisons of pretest and posttest scores within and between groups enabled the researcher to determine the extent to which each medium contributed to students' improvement in writing.

B. *Setting and Participants*

The research was conducted at SD Negeri 112 Parbangunan in Mandailing Natal Regency during the 2025–2026 academic year. The school was selected purposively because it exhibited typical characteristics of public primary schools in the region, including heterogeneous student backgrounds and limited but functional access to technological resources.

The study population comprised all fourth-grade students at the school, totalling 40 learners distributed across two classes, IVA and IVB. Given the relatively small population, a total sampling technique was applied, including all students as research subjects. Class IVA (20 students) served as the experimental group, receiving treatment using PowerPoint media, while class IVB (20 students) served as the control group, receiving instruction using picture media. This assignment followed existing class groupings to avoid disruption of school organization (Sugiyono, 2019).

C. *Instruments*

Data on students' learning outcomes were collected using writing tests designed to assess their ability to produce descriptive texts in Indonesian. The tests were administered as pretests and posttests. Items were constructed based on the relevant competency standards for grade IV, focusing on identifying and applying the structure of descriptive texts, using appropriate adjectives, and developing main ideas coherently (Alamo et al., 2021).

The main instrument was a set of tasks requiring students to write descriptive texts based on given stimuli. In addition, supporting multiple-choice items were developed to assess understanding of descriptive text features and the use of language elements, such as adjectives and main ideas. A test blueprint (kisi-kisi) was prepared to ensure content validity by mapping items to indicators, such as explaining the characteristics of descriptive texts, composing descriptive texts based on visual stimuli, using adjectives, and determining main ideas.

Prior to the main study, the test instruments were piloted with a group of students having characteristics similar to the target sample. Item analysis was conducted to examine validity and reliability. Validity was assessed using the product moment correlation coefficient between item scores and total scores. Items with correlation coefficients greater than the critical r value (0.339 for $N = 40$ at $\alpha = 0.05$) were considered valid, while those below the threshold were revised or discarded. The validity analysis indicated that most items met the criterion.

Reliability was evaluated using a split-half procedure with the Spearman–Brown formula. Item scores were separated into odd and even subsets, and the correlation between the two halves was computed. The resulting reliability coefficient for the overall test was 0.92, which exceeded the commonly accepted threshold of 0.70. This result indicates that the instrument has very high internal consistency and is suitable for measuring students' writing-related learning outcomes in this study.

D. Data Collection Procedures

Data collection proceeded in several stages. First, preliminary coordination was conducted with the school principal and class teachers to explain the research objectives, procedures, and schedule. Permission was obtained, and the research timeline was aligned with the regular Indonesian language lessons to minimize disruption.

Second, both groups underwent a pretest under standardized conditions. The pretest aimed to determine students' initial writing ability and verify group equivalence before treatment. Students were given a specified

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amount of time to complete the writing tasks, and their responses were scored according to predetermined criteria.

Third, the intervention phase was implemented over a series of lessons in which each class received instruction using a different medium but otherwise similar content and objectives. In the experimental group, the teacher used PowerPoint slides to present material on descriptive texts, including definitions, text structure, language features, model texts, and writing steps. The slides incorporated text, images, and layout features designed to capture attention and clarify concepts. During lessons, the teacher guided students through observing examples, identifying key elements, discussing content, and practising writing with prompts displayed on the slides.

In the control group, the teacher relied on picture media as the primary visual stimulus. Images relevant to the topics of descriptive texts were displayed using printed materials or simple projections without structured multimedia slides. The students observed the pictures, discussed what they saw, and then wrote descriptive texts based on these visuals. The teacher provided explanations and feedback verbally and used the pictures to prompt vocabulary and idea generation.

Although the media differed, efforts were made to keep other instructional variables as comparable as possible. Both groups received instruction from teachers following similar lesson sequences: introduction of objectives, presentation of examples, guided practice, independent writing, and feedback. The duration and frequency of lessons were also matched to ensure that any observed differences could reasonably be attributed to the differing media rather than to instructional time or content coverage.

Finally, after the intervention period, both groups underwent a posttest using equivalent tasks and scoring criteria as those used in the pretest. The posttest measured students' writing achievement after exposure to the respective media. All scripts were scored by the researcher using consistent rubrics focusing on content, organization, language use, and mechanics. The scores were then tabulated for statistical analysis.

E. *Data Analysis*

Data analysis followed standard quantitative procedures. First, descriptive statistics were calculated for both groups' pretest and posttest scores, including means and measures of dispersion. These descriptive statistics provided an initial overview of performance levels and changes over time.

Second, assumption tests were conducted. The normality of the score distributions for each group was examined using the chi-square (χ^2) test. For both variables, the obtained χ^2 values were lower than the critical values at the 0.05 significance level, indicating that the data were normally distributed. The homogeneity of variance between groups was evaluated using the F-test by comparing larger variances with smaller variances. The calculated F value (approximately 1.05 for posttest data) was lower than the critical F value (2.16) at $\alpha = 0.05$ with 19 and 19 degrees of freedom, indicating that the variances were homogeneous.

Having satisfied the assumptions of normality and homogeneity, an independent-samples t-test with separated variance formula was applied to compare the posttest means of the two groups. The significance level was set at 0.05, with the degrees of freedom calculated as $N1 + N2 - 2 = 38$. The resulting t-value was then compared with the critical t-value to determine whether the difference between groups was statistically significant.

III. RESULTS AND DISCUSSION

A. *Descriptive Results*

The analysis began with a description of students' performance before the intervention. In the pretest, class IVA (PowerPoint group) obtained a mean score of 47.50, with a relatively wide score dispersion, indicating generally low initial writing ability. Class IVB (picture group) achieved a slightly lower mean score of 42.50, also with substantial variability. Both means were below typical mastery thresholds, confirming that students in both groups initially struggled with writing tasks and that there was room for improvement.

During the posttest, the differences between the two groups became more pronounced. The experimental group taught using PowerPoint media attained a posttest mean score of 74.75, reflecting marked improvement from pretest levels. The control group taught using picture media also improved, achieving a posttest mean of 65.50. Thus, both instructional approaches were associated with gains in writing performance; however, the magnitude of improvement was greater in the PowerPoint group.

Table 1 summarizes the key descriptive and inferential statistics for the post-test scores of both groups.

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Table 1. Posttest Writing Scores by Instructional Media

Group	n	Pretest mean	Posttest mean	Posttest SD	t(38)	p (α = 0.05)
PowerPoint (Class IVA)	20	47.50	74.75	≈12.2		
Picture media (Class IVB)	20	42.50	65.50	≈12.9	2.27	< 0.05

Note: SD values were approximated from the reported variance and standard deviation calculations in the original analysis.

The table shows that both groups improved from pretest to posttest, but the experimental group started slightly higher and ended with a considerably higher mean. The standard deviations suggest that, despite overall gains, variability in performance remained, indicating that not all students benefited to the same extent.
Before conducting the t-test, the assumptions of normality and homogeneity were verified. Normality tests using chi-square statistics showed that the score distributions of both groups did not differ significantly from a normal distribution. For the PowerPoint group, χ^2 for posttest scores was below the critical value for the relevant degrees of freedom, and a similar pattern was found for the picture group. These findings support the use of parametric tests.
Homogeneity of variance was examined using an F-test. The posttest variances for the PowerPoint and picture groups were approximately 156.51 and 176.05, respectively. The resulting F value of approximately 1.05 was less than the critical F(0.05;19,19) = 2.16, indicating that the assumption of equal variances was satisfied. This allowed the use of the standard independent-samples t-test to compare group means.
The independent-samples t-test comparing posttest scores yielded t(38) = 2.27. The critical t-value at the 0.05 significance level (two-tailed) with 38 degrees of freedom was 2.02. Because the obtained t-value exceeded the critical value, the null hypothesis stating that there was no difference in mean posttest scores between the two media was rejected. The alternative hypothesis—that there is a significant difference in writing outcomes between students taught using PowerPoint and those taught using picture media—was accepted. In practical terms, this result confirms that PowerPoint media produced significantly higher writing achievement than picture media in this context.

B. *Discussion*

The substantial improvement in the mean score of the PowerPoint group (from 47.50 to 74.75) —indicates that students moved from generally low to reasonably satisfactory levels of writing performance. This gain suggests that the combination of visual structuring, clear sequencing of content, and multimodal presentation inherent in PowerPoint supported students in understanding and applying the features of descriptive texts. The slides likely helped students focus on key components, such as topic sentences, supporting details, and concluding statements, while also exposing them to model language and vocabulary (Wahyuningsih et al., 2025).
The improvement of the picture group (from 42.50 to 65.50) —also represents meaningful progress. Picture media successfully stimulated students' imaginations and provided concrete referents for description. By observing and discussing images, students could generate ideas about objects, scenes, and situations, which they then translated into written form. However, the lower final mean compared to the PowerPoint group suggests that static pictures alone may be less effective in structuring the writing process and emphasizing textual organization (Andi Siti Nurfadhilah, 2025).
The differences in outcomes can be understood in terms of how each medium supports key aspects of writing. Writing requires not only idea generation but also planning, organization, and language control. Pictures primarily aid idea generation and vocabulary activation. In contrast, a well-designed PowerPoint lesson can integrate idea generation with explicit instruction on structure and language, presented across sequential slides. For example, one slide may present a complete model paragraph, another may highlight adjectives, and a third may guide students through creating their own sentences. This stepwise guidance may be particularly beneficial for primary students who are still developing their ability to organize and monitor their writing independently.
Another important consideration is the role of teacher mediation. The effectiveness of any medium depends heavily on how it is used. In the PowerPoint-based lessons, the teacher could exploit features such as bullet points, color highlighting, and animations to draw attention to particular aspects of the text and to control the pace of information delivery. This may have facilitated clearer explanations and more focused discussions.

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Moreover, because slides can be prepared in advance, the teacher may have been better able to plan the logical flow of the lesson, thereby reducing cognitive load for both the teacher and the students (Syahri et al., 2026). In picture-based lessons, much of the structuring relies on the teacher's spontaneous oral explanations and questioning. Although pictures provide rich raw material for discussion, they do not inherently organize content into a clear progression of concepts. If teacher explanations are less systematically planned, students may receive less explicit guidance on how to transform visual observations into well-organised written texts. This could partly explain the smaller gains observed in the picture group.

Observational notes also report that students in both groups showed increased motivation when media were used compared to traditional textbook-only lessons. In the PowerPoint group, students often displayed heightened attention when animations or color changes occurred, and they appeared eager to read or respond to prompts displayed on the screen. In the picture group, students actively engaged in describing what they saw in the images and enjoyed sharing their interpretations. These behaviors suggest that both media can foster more interactive and student-centered learning environments than purely verbal instruction (Ohle-Peters et al., 2025).

The findings of this study are broadly consistent with earlier research indicating that PowerPoint can improve learning outcomes in primary classrooms. Prior studies in thematic and science subjects have reported higher mean scores and greater effect sizes for classes taught with PowerPoint compared to more traditional media, including static visuals. The present study extends these findings to the domain of Indonesian language writing, demonstrating that the advantages of PowerPoint are not limited to content-heavy subjects but also apply to skill-based learning.

Simultaneously, the results resonate with research showing that picture media can positively influence students' participation and understanding, even if they are not always the most powerful medium in terms of measurable achievement gains. In this study, although the performance of the picture group lagged behind that of the PowerPoint group, the observed improvement from pretest to posttest confirms that pictures remain a useful and viable medium, especially in contexts where technology is limited or unreliable.

These patterns support a nuanced conclusion: PowerPoint appears to offer an incremental advantage over picture media for improving writing outcomes; however, both media are pedagogically valuable. The key issue is not simply choosing one medium over another but understanding their respective strengths and how they can be integrated or alternated in teaching practice.

From a practical standpoint, the study results underscore the importance of integrating technology-based media, such as PowerPoint, into Indonesian language teaching at the primary level, particularly for writing instruction. Schools that have access to basic equipment (computers and projectors) can leverage these tools to design more engaging and structured writing lessons. Teachers should be encouraged and supported to develop pedagogical competencies in creating effective PowerPoint presentations that go beyond decorative features and focus on core learning objectives (Destiara Andini Ulandari, 2025).

However, the continued usefulness of picture media should not be overlooked. Pictures are easy to prepare, inexpensive, and versatile, and they can be particularly helpful for stimulating imagination and catering to visual learners. Teachers might choose to combine both media—for instance, using pictures embedded within PowerPoint slides or starting with printed pictures and then reinforcing learning by summarizing points on a projected slide. Such combinations could maximize the complementary strengths of each medium.

Furthermore, the study highlights the need for ongoing professional development focused on media-based writing instruction. Training should not only address technical skills (such as operating PowerPoint software) but also instructional design principles, including how to scaffold writing tasks, sequence content, and provide constructive feedback. Without such pedagogical grounding, even advanced media may fail to produce meaningful learning gains.

Although the study offers valuable insights, several limitations should be acknowledged. First, the use of a nonequivalent control group design precluded random assignment at the individual level. Although pretest scores and assumption tests suggested that the groups were reasonably comparable, unmeasured differences between classes may have influenced the outcomes. Future research could strengthen internal validity by employing randomized controlled designs where feasible.

Second, the study was conducted in a single school with a relatively small sample size (40 students), which may limit the generalizability of the findings. Replication in other schools and regions, including those with different socio-economic and infrastructural conditions, would be beneficial to confirm the robustness of the results.

Third, the study primarily focused on quantitative outcomes measured through test scores. Qualitative data, —such as in-depth interviews with students and teachers, analysis of students' drafts and revisions, and

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classroom observations, —could provide a richer understanding of how and why particular media influence the writing process. Future research might adopt mixed-methods approaches to capture both performance data and process-oriented insights.

Finally, the study examined only one genre of writing, namely, descriptive texts. It remains an open question whether the relative effectiveness of PowerPoint and picture media would be similar for other genres, such as narrative, expository, or argumentative writing. Comparative studies across genres could help teachers tailor media choices to specific instructional goals.

IV. CONCLUSIONS

This study examined the comparative effectiveness of PowerPoint and picture media in improving fourth-grade students' writing ability in Indonesian language lessons at SD Negeri 112 Parbangunan. Using a nonequivalent control group design, the research found that both media contributed to significant gains in students' writing outcomes, as evidenced by improvements from low pretest means to substantially higher posttest means in both groups. However, the PowerPoint group achieved a higher posttest mean score (74.75) than the picture group (65.50), and the difference between groups was statistically significant, $t(38) = 2.27$, $p < 0.05$. These results indicate that PowerPoint media was more effective than picture media in enhancing writing performance under the conditions of this study. The likely reasons include PowerPoint's capacity to structure content systematically, integrate multiple modes of representation, and support stepwise guidance through the writing process, thereby reducing cognitive load and clarifying expectations for students. Nonetheless, the observed improvement in the picture group confirms that picture media also has pedagogical value, particularly for stimulating ideas and supporting visualization. The findings therefore suggest that schools and teachers should prioritize—but not exclusively rely on—PowerPoint for writing instruction where technological resources and teacher competencies permit. In parallel, they should continue to utilize and refine picture-based activities, especially in contexts with limited access to technology. Overall, the study reinforces the broader pedagogical principle that careful selection and skillful use of instructional media can substantially enhance students' learning outcomes. For Indonesian language education at the primary level, particularly in the domain of writing, integrating well-designed PowerPoint presentations with meaningful visual stimuli offers a promising avenue for improving literacy achievement and supporting the development of confident, competent young writers.

Funding Statement

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Ethical Compliance

All procedures performed in the studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committees and the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Data Access Statement

A data access statement is a section in a scientific publication or research report that explains how the data used or generated in the study can be accessed by readers or other researchers. This statement aims to promote transparency, support research reproducibility, and comply with applicable open access policies.

Common Elements in a Data Access Statement:

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   - "The data supporting this study are openly available in Zenodo at [DOI:10.xxxx/zenodo.xxxx]."
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   - "The data that support the findings of this study are available upon request from the corresponding author. Owing to privacy concerns, the data are not publicly available."

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3. No Data Available:
   - "No datasets were generated or analyzed in the current study."
4. Conditional Access:
   - "The data supporting this study are available under restricted access and can be obtained from the corresponding author upon reasonable request, with permission from the ethics committee."

Purpose of a Data Access Statement:

- Reproducibility: Enables other researchers to replicate or verify the findings.
- Collaboration: Encourages further collaboration by sharing data.
- Compliance: Adherence to the policies of funding agencies or journals that require open access to data.

Conflict of Interest Declaration

The authors declare that they have no affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

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