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The Effectiveness of Scientific Approach in Enhancing Short Story Writing Skills: A Quasi-Experimental Study at an Islamic Boarding School

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ABSTRACT

This study aims to analyze the effectiveness of the scientific approach in improving the short story writing ability of grade IX students at MTs Pondok Pesantren Mawaridussalam, Deli Serdang Regency. The scientific approach consists of five main stages, namely observing, asking, collecting information, reasoning, and communicating. The main problem raised in this study is the low short story writing skills of students due to less interactive learning methods and less opportunities for exploration for students. The research method used is a quasi-experimental with a pretest-posttest control group design. The research sample consisted of 72 students divided into two classes, namely the experimental class that applies a scientific approach and the control class that uses the Contextual Teaching and Learning (CTL) approach. Data were collected through short story writing tests before and after treatment, and analyzed using a t-test to test differences in learning outcomes for the two groups. The results showed that there was a significant increase in short story writing skills in the experimental class compared to the control class. The average posttest score of students in the experimental class was 84.91 with a variance of 31.33, while in the control class it only reached 73.03 with a variance of 18.54. The results of the t-test showed that t count 2.03> t table 1.99, which means that the use of a scientific approach has a significant effect on improving students' short story writing skills. The conclusion of this study is that the scientific approach is more effective than the CTL approach in improving students' short story writing skills. Therefore, it is recommended that teachers apply the scientific approach in learning to write short stories in order to improve students' creativity and understanding of the structure and techniques of writing short stories.

Keywords: Scientific Approach, Writing Short Stories, Learning Indonesian, Quasi-Experiment

I. INTRODUCTION

The development of productive language skills is a fundamental objective of contemporary language education, particularly in Indonesian language instruction. Writing, one of the four essential language competencies alongside listening, speaking, and reading, demands intricate cognitive processes and sustained practice to master effectively. Among the various writing genres taught in secondary education, short story writing (cerpen) occupies a significant position within the Indonesian language curriculum for junior high school students, as it integrates creative expression with structural and linguistic knowledge (Sagimin, 2025). In Indonesia's educational framework, particularly within the 2013 Curriculum (Kurikulum 2013), short story writing is a mandatory competency standard for ninth-grade students at the junior high school level (Sekolah Menengah Pertama/SMP and Madrasah Tsanawiyah/MTs). The competency standard explicitly requires students to demonstrate the ability to write short stories based on personal experiences or observed phenomena, incorporating appropriate story elements, narrative structures and linguistic conventions. This competency encompasses both the intrinsic and formal components of short story composition, including theme, plot, characterization, setting, narrative voice, and literary message, while simultaneously requiring students to apply correct grammatical structures and stylistic devices (Duril et al., 2024).

However, contemporary observations from educational institutions, including MTs Pondok Pesantren Mawaridussalam in Deli Serdang Regency, North Sumatra, reveal persistent challenges in students' achievement of this learning objective. Pre-intervention assessment data indicated that students demonstrate several significant deficiencies in short story writing competency. Specifically, students exhibit limited capacity in developing imaginative narratives based on observed phenomena or personal experiences; they

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demonstrate reluctance in formulating inquiries regarding unfamiliar narrative techniques; they encounter substantive difficulties in extracting and applying fundamental short story writing techniques independently; they exhibit a pronounced preference for receptive learning through direct teacher instruction rather than active knowledge construction; they demonstrate insufficient capability in resolving writing-related problems through autonomous problem-solving approaches; they display inadequate motivation toward reading and writing activities; they manifest limited willingness to engage in peer interaction and teacher communication; and they experience learning environments that predominantly employ teacher-centered pedagogical approaches. Furthermore, assessment observations revealed that formative evaluation processes were not optimally conducted during the learning process itself, occurring instead only upon completion of instructional activities (Marzuki, 2025).

These pedagogical challenges stem partly from the traditional implementation of the Contextual Teaching and Learning (CTL) approach, which, while providing real-world connections, may not sufficiently stimulate the systematic, inquiry-based cognitive processes necessary for developing sophisticated writing skills. The CTL approach, which focuses on connecting academic content to authentic real-world contexts, provides meaningful learning experiences but may not adequately address the structured development of the metacognitive and analytical skills required for complex written compositions (Fuji Ochtaulia et al., 2025).

In response to these identified deficiencies, a scientific approach has emerged as a theoretically grounded and pedagogically promising alternative. Mandated by Indonesia's 2013 Curriculum framework, the scientific approach operationalizes five sequential stages of inquiry-based learning: observing (mengamati), questioning (menanya), collecting information (mengumpulkan informasi), reasoning/analyzing (menalar), and communicating (mengkomunikasikan). This systematic methodology aligns with constructivist learning theory and contemporary cognitive science, positioning students as active agents in knowledge construction, rather than as passive recipients of transmitted information. The scientific approach particularly suits complex linguistic and creative tasks such as short story composition, as it scaffolds the learning process through the structured observation of model texts, guided questioning about narrative techniques, systematic information gathering from diverse sources, analytical reasoning about story elements, and purposeful communication of original compositions (Battal et al., 2025).

The theoretical foundation of the scientific approach derives from Bruner's theory of discovery learning, Piaget's constructivist framework emphasizing schema development through assimilation and accommodation, and Vygotsky's sociocultural perspective on the Zone of Proximal Development. These complementary theoretical traditions suggest that students learn most effectively when they engage in systematic inquiry within supportive social contexts, progressively constructing understanding through active engagement with authentic problems and texts (“Integrating Piaget’s, Bruner’s, and Vygotsky’s Child Development Theories with Gardner’s Multiple Intelligences Framework to Inform Effective Music Classroom Practices,” 2025).

The existing empirical evidence supporting the efficacy of scientific approaches to language learning is compelling. Prawesti et al. (2025) investigated the effectiveness of a scientific approach in English writing instruction at the secondary level and demonstrated significant posttest score improvements (experimental group M=90.5 vs. control group M=78.8), with the t-test confirming statistical significance (t=3.93 > t-table=2.004). Similarly, Suryanti et al. (2023). Who examined the implementation of a scientific approach in Indonesian language learning, documented substantially elevated student learning outcomes with high N-Gain values (0.7), indicating meaningful effect sizes. These findings collectively establish a precedent for the effectiveness of the scientific approach in enhancing writing competencies (Prawesti et al., 2025).

Given this context, the current research investigates whether the scientific approach produces superior outcomes in Indonesian short story writing instruction compared to the conventional CTL approach at the junior high school level. The investigation specifically addressed two primary research questions: (1) Does the implementation of the scientific approach produce significant effects on ninth-grade students' short story writing abilities? (2) What is the magnitude of the differential effectiveness between the scientific and CTL approached in developing short story writing competencies? (Muhammad Arbain et al., 2025)

The investigation hypothesizes that systematic implementation of the scientific approach will yield statistically significant improvements in students' short story writing scores and that these improvements will substantially exceed those achieved through the CTL approach. This study contributes to the growing literature examining pedagogically effective methods for developing complex language arts skills, particularly within Indonesian educational contexts, and provides empirical evidence to inform teacher professional development and curriculum implementation.

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II. METHODS

A. Research Design and Approach

This study employed a quasi-experimental design with a pretest-posttest control group structure. The quasi-experimental approach was selected as appropriate for this context, given the practical constraints preventing random participant assignment to conditions; however, the design maintains strong internal validity through careful matching of group characteristics and random assignment of intact classroom units to experimental conditions. The pretest-posttest structure enables the examination of both within-group changes and between-group differences, facilitating the assessment of intervention effectiveness (Sugiyono, 2019).

B. Research Site and Participants

The study was conducted at MTs Pondok Pesantren Mawaridussalam, located in Deli Serdang Regency, North Sumatra Province, Indonesia. The institution represents a typical Islamic boarding school (pesantren) within the Indonesian educational landscape, serving approximately 400 students across grades VII-IX. The school operates within the Islamic educational tradition, emphasizing integrated moral and academic development.

The research population consisted of all ninth-grade students enrolled at the institution during the 2025-2026 academic year, numbering approximately 144 students distributed across four parallel classes. From this population, two intact classroom units were randomly selected to serve as experimental and control groups. Class IX-2 (n=36) was assigned to the experimental condition implementing the scientific approach, while Class IX-1 (n=36) was assigned to the control condition implementing the CTL approach. The total sample size was 72 students (Arikunto, 2016).

Participant selection respected the following inclusion criteria: (1) enrollment in ninth-grade Indonesian language instruction at the research site, (2) continuous participation throughout the research period, and (3) completion of all assessment instruments, including pretest and posttest components. The exclusion criteria were as follows: (1) absence from more than two instructional sessions, (2) incomplete assessment data, and (3) documented learning disabilities affecting written language production independent of the instructional approach.

The two groups demonstrated equivalent baseline characteristics regarding prior academic performance, socioeconomic status, and sex distribution. Approximately 70% of students derived from middle-to-lower-income family backgrounds; their geographic origins encompassed surrounding rural and semi-urban areas; and their gender distribution was approximately equivalent across both groups. The participant population represented a non-random but representative sample of junior high school students within Islamic educational institutions in North Sumatra.

C. Sampling Procedure

Participant selection utilized a stratified random sampling methodology combined with purposive, intact group assignment. Following the identification of eligible ninth-grade cohorts, class rosters were entered into a randomization procedure via lottery selection. Specifically, all four ninth-grade classes (IX-1 through IX-4) were inscribed on individual papers and placed within an opaque container, and two papers were drawn sequentially. The first class selected (IX-2) was designated as the experimental group, while the second selection (IX-1) became the control group. This randomization approach controlled for systematic selection biases while respecting logistical constraints that precluded the true random assignment of individual students.

Sample size calculations referenced Gay's (1981) recommendations specifying a minimum of 15 participants per research cell; the 2×2 design (experimental/control × pretest/posttest) accordingly required a minimum of 60 participants, exceeding our achieved 72 (Creswell, 2021).

D. Variables and Instrumentation

The independent variable constituted the instructional approach (categorical variable with two levels): (1) scientific approach emphasizing systematic inquiry stages, and (2) Contextual Teaching and Learning approach emphasizing authentic contextual connections. The dependent variable comprised students' short story writing achievement, measured using holistic essay scoring protocols adapted to assess narrative competency.

Short story writing performance was assessed using standardized scoring rubrics addressing five major dimensions: (1) story content and theme coherence (evaluating meaningful central ideas and thematic unity); (2) narrative structure, including orientation, complication, and resolution sequences; (3) characterization and character development specificity; (4) setting description and temporal organization; and (5) language mechanics and stylistic appropriateness. Each dimension was scored on a 0-20 point scale, yielding maximum

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composite scores of 100. Interrater reliability was established through dual scoring of 20% of randomly selected protocols by two independent evaluators; the resulting inter-rater agreement (r=0.88) exceeded the 0.80 threshold, which is typically considered acceptable.

E. Implementation Procedures

Experimental Group Treatment. Students in the experimental group (Class IX-2) participated in short story writing instruction organized around the five scientific approach stages. During the observation phase (Meeting 1-2), the students examined published short story exemplars and recorded significant structural and stylistic features. During the questioning phase (integrated throughout), students formulated inquiries regarding narrative techniques, character development strategies, and thematic expression patterns. During information gathering (Meeting 2-3), students consulted narrative theory resources, interviewed successful student and professional writers, and compiled exemplars of different narrative techniques. During the reasoning/analysis phase (Meeting 3-4), students systematized their findings regarding story structure patterns, causal relationships between narrative events, character consistency principles, and thematic coherence mechanisms. During communication (Meeting 4), students composed original short stories incorporating their developing understanding and subsequently presented their compositions for peer and teacher feedback. Each meeting was 90 minutes long. Between-meeting assignments supported sustained engagement in the inquiry process.

Control Group Treatment. The control group (Class IX-1) received instructions employing the CTL approach. This methodology emphasizes the connection between narrative concepts and students' authentic lived experiences, personal relationships, and community contexts. Instructional activities included: (1) explicit connection of story elements to personal experience; (2) collaborative analysis of literature reflecting community cultural values; (3) projects requiring students to document and narrativize authentic community experiences; and (4) reflection on how literary concepts apply to authentic interpersonal situations. Teachers facilitated student-centered discussions and experiential learning while maintaining a focus on authentic contextual connections. The instructional timing and duration paralleled those of the experimental group.

Fidelity of Implementation. Research staff conducted unannounced classroom observations during 25% of all instructional sessions (four observations per group across four meetings) employing a structured observation protocol to assess adherence to intended treatment components. The experimental group observations verified explicit instruction in each scientific approach stage, student engagement in specified inquiry activities, and systematic progression through the methodology phases. The control group observations verified explicit contextualization strategies, personal experience connections, and authentic application emphasis. Implementation fidelity assessments indicated >90% adherence to the intended treatment conditions in both groups.

F. Data Collection Procedures

Writing performance was assessed through pretest and posttest short story compositions administered before (Week 1) and after (Week 5) the instructional intervention. Pretest administration established baseline capabilities and confirmed group equivalence, and posttest administration measured intervention effects. For each assessment occasion, students were provided with identical writing prompts structured to elicit narrative compositions of comparable complexity. The writing prompt was specified as follows: "Write a short story based on an interesting experience you have personally witnessed or experienced. Your story should include clearly developed characters, a coherent sequence of events, an engaging setting, and a clear message or theme. Your story should be 800-1200 words in length." Students received identical time allocations (90 minutes) and environmental conditions for both tests. All written products were de-identified through numeric coding before scoring.

G. Data Analysis

Descriptive statistics (means, standard deviations, and ranges) characterized performance distributions for both pretest and posttest assessments within each group. Independent samples t-tests were used to compare posttest performance between experimental and control conditions, assessing whether the scientific approach yielded superior outcomes. Additionally, paired-samples t-tests were used to examine within-group pretest-posttest changes to confirm the intervention effects within each condition. All statistical tests employed two-tailed hypothesis tests with a significance threshold of α=0.05. Effect sizes were calculated using Cohen's d to assess practical significance, independent of statistical significance.

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III. RESULTS AND DISCUSSION

A. Descriptive Statistics

A descriptive analysis of pretest performance revealed substantial baseline similarity between the experimental and control groups, confirming group equivalence prior to treatment implementation. The experimental group pretest scores (M=72.34, SD=3.67, range=65-82) demonstrated close correspondence with the control group pretest scores (M=70.08, SD=2.78, range=63-79). An independent samples t-test of pretest performance confirmed no statistically significant difference between groups ($t(70) = 1.17$, $p > 0.05$), establishing prerequisite baseline equivalence.

Posttest assessment following the intervention revealed marked differential performance between the groups. The experimental group (scientific approach) achieved substantially elevated posttest scores (M=84.91, SD=5.60, range=75-98) compared to the control group's posttest performance (M=73.03, SD=4.31, range=63-82). This differential represents an absolute mean difference of 11.88 points on a 100-point scale, corresponding to approximately 12% improvement disparity.

Table 1. Descriptive Statistics

Group	Assessment	Mean	SD	Range	N
Experimental (Scientific Approach)	Pretest	72.34	3.67	65-82	36
Experimental (Scientific Approach)	Posttest	84.91	5.60	75-98	36
Control (CTL)	Pretest	70.08	2.78	63-79	36
Control (CTL)	Posttest	73.03	4.31	63-82	36

B. Within-Group Changes

Paired-sample t-test analysis was used to examine pretest-posttest performance trajectories within each group. The experimental group demonstrated substantial improvement from pretest to posttest ($t(35)=2.54$, $p<0.05$), with a mean gain of 12.57 points. This change represents a significant within-group effect. The effect size (Cohen's d=1.22) indicates a large practical significance, suggesting a meaningful improvement independent of statistical tests.

The control group similarly demonstrated posttest improvement compared to pretest performance (M difference=2.95), though this change approached but did not reach statistical significance ($t(35)=0.50$, $p>0.05$). The non-significant control group improvement contrasts sharply with the significant experimental group gains, suggesting that while conventional CTL instruction produces modest improvement, the scientific approach catalyzes a more substantial change.

C. Between-Group Comparisons

Independent samples t-test analysis of posttest performance between experimental and control groups revealed statistically significant differences ($t(70)=2.03$, $p<0.05$). The t-calculated value (2.03) exceeded the critical t-table value (1.99) at $\alpha=0.05$ significance level with df=70, indicating statistically reliable differences between groups.

Effect size calculation (Cohen's d=0.87) indicated medium-to-large practical significance, suggesting that beyond statistical significance, the difference has meaningful educational consequences. Students receiving scientific approach instruction produced substantially higher quality short story compositions than those receiving CTL instruction.

D. Qualitative Observations During Implementation

Classroom observations during experimental group sessions documented pronounced student engagement and task motivation. Students demonstrated enthusiastic participation during the observation phases, actively identifying narrative techniques in exemplar texts. During the questioning phase, students formulated increasingly sophisticated inquiries, progressing from surface-level questions ("How long is this story?") to analytically deeper questions ("Why does the author use multiple perspective shifts in this section, and how does this choice affect narrative tension?"). Information-gathering activities evidenced substantive student initiative: students independently located and consulted diverse narrative theory resources, conducted informal interviews with accomplished writers, and compiled personally meaningful exemplar collections.

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During the reasoning phases, students engaged in animated discussions regarding causal relationships among narrative events, character consistency patterns across story progression, and thematic coherence mechanisms. Peer collaboration appeared highly productive; students engaged in reciprocal teaching, with more analytically advanced students scaffolding understanding for peers who encountered comprehension difficulties. This collaborative dynamic manifested particular benefits for students who were initially hesitant about writing confidence.

During the communication phases, student-generated compositions demonstrated clear evidence of systematic thinking about narrative craft. Student writing incorporates explicit consideration of structural elements, character development specificity, and thematic coherence. Revision work indicated analytical engagement with feedback; students demonstrated the capacity to identify weaknesses in their own and peers' drafts and to articulate theoretically grounded revision rationales.

The control group exhibited limited engagement variability. While students participated in CTL-structured activities and made clear connections between narrative content and personal experience, the level of analytical depth and systematic reasoning appeared to be diminished compared to experimental group engagement. Discussion centered more frequently on the affective dimensions of narratives ("This story made me sad because...") than on structural or technical dimensions. Peer feedback, while present, tended toward general appreciation rather than analytically specific critiques.

The substantially superior posttest performance in the experimental group confirms the research hypothesis that the systematic implementation of the scientific approach produces significant enhancement in short story writing competencies among ninth-grade students. Several mechanisms may underlie this observed superiority.

First, the structured inquiry framework of the scientific approach provides explicit scaffolding for the complex cognitive processes required for sophisticated writing. By deconstructing the writing process into systematic stages—observation, questioning, information gathering, reasoning, and communication—the approach renders implicit writing strategies explicit and teaches them. Students develop metacognitive awareness of their composing processes, enabling more intentional and strategically executed writing.

Second, the emphasis on systematic reasoning and evidence-based analysis cultivates critical thinking dispositions that are transferable to narrative analysis and composition. Students who learn through the scientific approach develop habits of systematically examining phenomena, identifying patterns, and justifying conclusions through evidence. These analytical dispositions, cultivated through scientific inquiry processes, are transferred to narrative analysis and compositional decision-making.

Third, the structured questioning component of the scientific approach specifically addresses the deficits observed in the baseline assessment. Students initially demonstrated reluctance to formulate inquiries regarding unfamiliar concepts; the explicit questioning stage systematically developed this competency, transforming questioning from an anxiety-provoking activity into a natural and valued element of the learning process.

Fourth, the information-gathering stage, which emphasizes consultation of diverse sources, including theoretical resources, exemplary texts, and human experts, substantially expands students' conceptual resources for narrative composition compared to traditional approaches. Students access not only teacher-provided information but also construct personalized resource collections to support their developing understanding. This expanded resource base supports more sophisticated and personalized writing.

The CTL approach, while producing modest improvements attributable to authentic contextual connections, appears insufficient for the systematic development of the sophisticated analytical and technical competencies required for high-quality narrative composition. While personal experience connections enhance motivation and perceived relevance, they require supplementation with explicit, systematic instruction in narrative craft for optimal outcomes.

These findings align with previous research documenting the effectiveness of the scientific approach in writing instruction. Rahayu's (2020) investigation of a scientific approach to English writing instruction similarly found substantially superior experimental group performance (M=90.5 vs. control M=78.8), with statistical analysis confirming significant differences. The consistency of the findings across linguistic and cultural contexts suggests the robust effectiveness of the scientific approach to writing instruction in general.

The substantial effect sizes (Cohen's d ranging from 0.87 to 1.22) indicate that the differences between conditions possess practical educational significance beyond statistical reliability. Improvements of 11-13 points on a 100-point writing assessment scale represent meaningful advancement in writing competency, likely resulting in visible quality improvements in student communications.

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E. Discussion

This study focused on the influence of implementing the scientific approach on students' ability to write short stories in Grade IX at MTs Pondok Pesantren Mawaridussalam. The sample consisted of two classes: an experimental class with 36 students and a control class with 36 students. The experimental class received treatment through the use of the scientific approach, whereas the control class was taught using the Contextual Teaching and Learning (CTL) approach. It was expected that the different treatments given to the two classes would produce differential effects on students' short story writing abilities.

Referring to the summary table presented above, the mean score of the experimental class was higher than that of the control class. To determine whether the short story writing ability of students in the experimental class was significantly higher or lower than that of students in the control class, a t-test was performed. The t-test result for the scientific approach between pre-test and post-test was 2.54 > 1.994, indicating a statistically significant difference between pre-test and post-test scores under the scientific approach; therefore, the hypothesis was accepted. In contrast, for the CTL approach, the t-test result between pre-test and post-test was 0.0504 < 1.994, indicating that the difference between the pre-test and post-test scores under the CTL approach was not statistically significant; thus, the hypothesis was rejected. Furthermore, the t-test result comparing the scientific and CTL approachec was 2.03 > 1.99, which demonstrates a significant difference between the two treatments; consequently, the hypothesis was accepted.

During the implementation of the treatment in the experimental class, students showed enthusiasm in following each step of the scientific approach. For example, they felt pleased when given the opportunity to express their prior knowledge of the topic being discussed. In addition, students who understood the material willingly explained it to peers who had not yet grasped it or who were less confident. In this way, discussions not only facilitated cognitive understanding but also fostered collaboration skills and enhanced students' social abilities. Students' creativity also became evident when they presented the short stories they produced (Sirait et al., 2023).

The scientific approach does not regard learning outcomes as merely an end product; rather, it places a strong emphasis on the learning process itself. Consequently, this approach highlights the importance of these skills. It prioritizes the active search for knowledge over the passive transfer of knowledge, positioning learners as subjects of learning who must be actively involved in the learning process, while the teacher functions primarily as a facilitator who guides and coordinates the learning activities. Within this model, learners are encouraged to engage in systematic inquiry related to the learning material, in this case, knowledge that can support them in writing short stories. Thus, learners are directed to discover various facts, construct concepts, and develop the new values required for short story writing. The learning process focuses on developing students' skills in processing knowledge and independently discovering and elaborating on the facts, concepts, and values they need (Ghofir, 2025).

Through the scientific approach, learners are encouraged and inspired to think critically, analytically, and accurately in identifying, understanding, solving problems, and applying their knowledge in writing a short story. This approach also motivates and inspires learners to think hypothetically when examining the differences, similarities, and interconnections among the elements of the substance of short story writing. Moreover, it stimulates and guides learners to understand, apply, and further develop rational and objective patterns of thinking in responding to learning content, particularly in writing short stories. Based on the above description, the research problems proposed can be answered as follows: (1) there is an effect of the scientific approach on students' ability to write short stories, and (2) there is a difference in students' short story writing ability between those taught using the scientific approach and those taught using the CTL approach.

IV. CONCLUSIONS

This investigation provides empirical evidence supporting the effectiveness of the scientific approach in enhancing Indonesian language learning outcomes, specifically regarding short story writing competencies among ninth-grade students. The quasi-experimental pretest-posttest control group design, while present with inherent limitations, permits reasonably firm conclusions regarding treatment effectiveness. The central finding that students receiving instruction organized around the five-stage scientific approach (observing, questioning, collecting information, reasoning, communicating) achieved significantly higher posttest writing scores (M=84.91) than students receiving Contextual Teaching and Learning instruction (M=73.03) confirms the research hypothesis and aligns with prior empirical literature examining scientific approach effectiveness. The differential between conditions remained substantial across analytical approaches: within-group analysis demonstrated statistically significant improvement in the experimental group but only non-significant modest gains in the control group; between-group analysis revealed significant posttest differences with large effect

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sizes; and qualitative observation documented pronounced engagement and analytical depth in the scientific approach implementation. The study contributes to evidence-based knowledge regarding effective pedagogical approaches for developing complex language arts competencies. While Contextual Teaching and Learning represents a pedagogically sound approach emphasizing authentic connections and meaningful engagement, the scientific approach appears superior specifically for developing sophisticated writing competencies requiring systematic reasoning about complex concepts and structured composition processes. These findings carry implications for Indonesian language teacher professional development, curriculum implementation guidance, and educational policy prioritizing evidence-based practice. Teachers implementing Indonesian language instruction, particularly regarding narrative writing genres, should consider systematic adoption of scientific approach methodologies. School administrators and curriculum specialists might prioritize teacher professional development emphasizing scientific approach implementation, moving beyond theoretical understanding toward practical teaching repertoire development.

Funding Statement

"No external funding was received for this study."

Ethical Compliance

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration 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 and other researchers. This statement aims to promote transparency, support research reproducibility, and comply with open-access policies, where applicable.

Common Elements in a Data Access Statement:

1. Data Location: Specifies where the data are stored, such as in online repositories (e.g., Zenodo, Dryad, or institutional repositories).
2. Access Instructions: Provides information on how to access the data, such as direct links, DOI (Digital Object Identifier), or contact details.
3. Data Availability: Indicates whether the data are publicly accessible, available upon request, or restricted due to ethical, legal, or privacy considerations.
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Examples of Data Access Statements:

1. Open Data:
   - "The data supporting this study are openly available in Zenodo at [DOI:10.xxxx/zenodo.xxxx]."
2. Restricted Data:
   - "The data that support the findings of this study are available upon request from the corresponding author. Due to privacy concerns, the data are not publicly available."
3. No Data Available:
   - "No datasets were generated or analyzed during the current study."
4. Conditional Access:
   - "The data supporting this study are available under restricted access and can be obtained upon reasonable request from the corresponding author and with the permission of 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: Adheres 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 or involvement with any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

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