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The Effectiveness of Contextual Learning Methods on Argumentative Text Writing Skills in Elementary School Students

Wina Kurniati[a*], Sri Dewi Nirmala[b]
[a*]Universitas Terbuka, Banten, Indonesia, 501232097@ecampus.ut.ac.id
[b]Universitas Terbuka, Banten, Indonesia, nirmaladewi@ecampus.ut.ac.id

*Correspondence: 501232097@ecampus.ut.ac.id

Abstract
This research examines the effectiveness of contextual learning methods based on cognitive learning theory in improving argumentation writing skills among 6th-grade elementary school students. Conducted at SDN 093 Tunas Harapan Cijerah, Bandung, with 27 participating student (N=27), this study is grounded in the cognitive constructivism principles of Piaget and Vygotsky's zone of proximal development theory. The study employs a qualitative approach to analyze how students construct argumentative knowledge through contextual experiences. The learning analysis focuses on two main aspects: contextual learning methods and argumentation writing skills. Data was collected through participatory observation, documentation of written portfolios, and semi-structured interviews with students. The results of the study indicate that contextual learning methods aligned with cognitive principles have a positive impact on students' ability to formulate logical arguments, use supporting evidence, and develop coherent text structures. The scaffolding process in contextual learning helps students develop cognitive schemes about argumentation and enhances metacognition while writing. Students show increased motivation and active engagement in the learning process when the material is linked to relevant cognitive real-life experiences. These findings indicate that a contextual approach combined with cognitive learning theory has the potential to be an effective strategy for developing argumentative writing skills at the elementary education level.

Keywords:
Cognitive Learning Theory;
Contextual Learning;
Writing Skills

1. Introduction

1.1 Background of the Study

The skill of writing argumentative texts represents one of the critical competencies that must be developed in elementary school students, particularly in upper grades. The ability to express ideas logically, organize coherent arguments, and persuade readers through argumentative writing constitutes an essential foundation for students' academic success at higher education levels and effective participation in civic discourse. However, empirical evidence from national and international assessments reveals persistent challenges in Indonesian students' writing performance. The 2018 Programme for International Student Assessment (PISA) results indicated that Indonesia ranked 72nd out of 77 participating countries in reading literacy, with only 30% of students reaching Level 2 proficiency, which includes basic argumentative comprehensions skills (OECD, 2019). More specifically, the 2019 Indonesian National Assessment (Asesmen Kompetensi Siswa Indonesia/AKSI) revealed that only 46.83% of fifth-grade students achieved satisfactory levels in writing competencies, with argumentative writing identified as the most challenging genre (Puspendik, 2019).

Reality in the field demonstrates that many elementary school students still face substantial difficulties in writing argumentative texts. This difficulties encompass the ability to develop logical arguments, identify and integrate relevant supporting evidence, employ persuasive language effectively,

and organize ideas systematically within coherent text structures. Conventional writing instruction tends to be predominantly theoretical, teacher-centered, and insufficiently connected to students' real-life contexts, resulting in less meaningful learning processes and suboptimal learning outcomes. Students often perceive argumentative writing as an abstract academic exercise divorced from their lived experiences, leading to decreased motivation and engagement (Graham & Harris, 2016).

Contextual learning methods grounded in cognitive learning theory offer promising potential to address these pedagogical challenges. Cognitive learning theory emphasizes that learning occurs through active processes of forming and restructuring cognitive schemas, wherein students construct knowledge based on dynamic interactions between their existing conceptual frameworks and new experiences (Piaget, 1970; Bruner, 1966). Jean Piaget posited that children age 7-11 years are at the concrete operational stage, during which they require tangible, real-world experiences to comprehend abstract concepts and develop higher-order thinking skills.

Meanwhile, Vygotsky's (1978) theory of the zone of proximal development (ZPD) underscores the critical importance of social interaction, collaborative learning, and scaffolding in facilitating cognitive development. Contextual learning, which systematically connects academic content to students's authentic situations and encourages them to establish meaningful links between formal knowledge and daily life contexts, aligns coherently with these foundational cognitive principles (Johnson, 2002).

The significance of this topic resides in the pressing need to develop evidence-based, effective pedagogical methods to enhance argumentative writing skills among elementary school students. Argumentative competencies extend beyond the domain of language learning, playing instrumental roles in developing critical thinking, analytical reasoning, and sophisticated problem-solving abilities (Reznitskaya & Anderson, 2002; Kuhn & Moore, 2015). In the contemporary information and digital age, students must be equipped with capacities to analyze information critically, evaluate competing arguments objectively, identify logical fallacies, and communicate their perspectives effectively through multiple modalities. Furthermore, argumentative literacy is intrinsically connected to critical literacy and media literacy, which constitute essential 21st-century competencies for informed citizenship and academic achievement (Hillocks, 2011).

1.2 Research Benefits and Contributions

This research on contextual learning based on cognitive learning theory provides multiple scholarly and practical contributions. First, it offers an alternative pedagogical approach that can substantively enhance the quality of writing instruction in Indonesian elementary schools. For students, this approach is anticipated to increase intrinsic motivation for learning, deepen conceptual understanding of argumentative structures, and develop argumentative writing skills more effectively through meaningful, scaffolded experiences. For teachers, this research provides empirically-grounded insights and practical instructional strategies for designing contextually relevant writing lessons that align with students' cognitive developmental stages and sociocultural backgrounds. More broadly, this research contributes to the expanding body og knowledge on innovative, student-centered methodologies for Indonesian language teaching and addresses the gap in research specifically examining contextual approaches to argumentative writing instruction at the elementary level.

1.3 Review of Related Literature

International and national research has increasingly demonstrated the effectiveness of contextual learning approaches across various dimensions of language education. Marzano's (2010) meta-analysis of instructional strategies revealed that contextual learning methods yielded effect sizes of 0.59 for reading comprehension and 0.52 for writing quality, indicating moderate to strong positive impacts. In the specific domain of argumentative writing, Ferretti and Lewis (2019) conducted a comprehensive review identifying that instruction integrating authentic contexts, explicit strategy teaching, and collaborative discussion produced the most substantial improvements in elementary students' argumentative text quality. Similarly, De La Paz and Graham's (2002) experimental study with fifth-grade students demonstrated that contextualized instruction combining planning strategies with authentic writing purposes significantly enhanced argument development and organizational coherence.

Within the Indonesian context, several studies have examined contextual approaches to language learning. Widodo's (2021) research indicated that contextual methods improved narrative writing skills among fifth-grade elementary students, though the study focused on narrative rather than argumentative

genres. Kusuma (2020) found that contextual problem-based learning positively influenced students' critical thinking skills in language learning contexts. Rahmawati (2022) revealed that integrating cognitive theory principles in writing instruction enhanced the overall quality of students' written products. However, these studies either addressed different text genres or did dot specially target the integration of contextual learning with cognitive learning theory for developing argumentative writing competencies in sixth-grade elementary students.

Recent international scholarship on cognitive approaches to writing instruction has emphasized the importance of aligning pedagogical methods with students' developmental stages. Graham, Harris, and Santangelo (2015) in their comprehensive review of evidence-based writing practices identified that strategy instruction grounded in cognitive process models, when combined with meaningful contexts, produced the strongest effects for elemetary writers. McCutchen's (2006) developmental model of writing expertise highlights that elementary-aged students benefit particularly from instruction that reduces cognitive load through scaffolding while simultaneously connecting abstract writing concepts to concrete, familiar experiences-precisely the approach offered by contextual learning methods informed by cognitive theory.

Despite this growing body of literature, research specifically examining the effectiveness of contextual learning methods based on cognitive learning theory for developing argumentative writing skills in Indonesian sixth-grade elementary students remains notably limited. This gap is particularly significant given that argumentative writing represents a developmentally appropriate yet cognitively demanding task for students at this educational level, requiring integration of multiple competencies including logical reasoning, evidence evaluation, persuasive language use, and metacognitive awareness.

1.4 Characteristics of Argumentative Text for Sixth-Grade Elementary Students

Argumentative texts at the sixth-grade elementary level possess distinctive characteristic that differentiate them from more advanced academic argumentation while remaining developmentally appropriate for students age 11-12 years. According to the Indonesian Language Curriculum (Kurikulum Merdeka) for elementary schools, argumentative texts for Grade 6 students should demonstrate: (1) a clear position statement or thesis that expresses the writer's viewpoint on a familiar, age-appropriate issue; (2) two to three main arguments that support the stated position, each developed in separate paragraphs; (3) concrete evidence drawn from students' observations, experiences, or simple authoritative sources to substantiate claims; (4) use of persuasive language features including opinion markers (menurut saya/according to me, saya yakin/I believe), reasoning connectives (karena/because, oleh karena itu/therefore, akibatnya/as a result), and emphatic expressions; (5) basic counterargument acknowledgement or rebuttal for more advanced students; and (6) a concluding paraghraph that restates the position and summarizes key arguments (Kemendikbudristek, 2022).

The cognitive demands of argumentative writing align with Piaget's concrete operational stage characteristics, as sixth-grade students are developing abilities to engage in logical reasoning, consider multiple perspectives, and organize information hierarchically, though they still benefit from concrete examples and scaffolded support (Chrowhurst, 1990). Research by Ferretti and Fan (2016) indicates that elementary students at this developmental level can produce basic argumentative structures when provided with explicit instruction in argument components, modeling of argumentative thinking, and opportunities to engage with authentic, personally relevant topics. Therefore, effective argumentative writing instruction for sixth-grade students must balance cognitive challenge with appropriate scaffolding, connect abstract argumentative concepts to concrete experiences, and select topics that resonate with students' developmental interests and lived contexts.

1.5 Research Questions and Objectives

Based on the background, literature review, and identified research gaps, this study formulates the following research questions: 1) How are contextual learning methods based on cognitive learning theory implemented in teaching argumentative text writing to sixth-grade elementary school students?, 2) To what extent are contextual learning methods based on cognitive learning theory effective in improving the argumentative text writing skills of sixth-grade elementary school students?, 3) What factors support and hinder the implementation of contextual learning methods based on cognitive learning theory in developing students' argumentative writing competencies?

Correspondingly, the objective of this research are: 1) To describe the implementation process of contextual learning methods based on cognitive learning theory in argumentative text writing instruction for sixth-grade elementary etudents, 2) To analyze the effectiveness of contextual learning methods based on cognitive learning theory in enhancing sixth-grade elementary students' argumentative writing skills, 3) To identify and examine the supporting and hindering factors in implementing contextual learning methods based on cognitive learning theory for developing students' argumentative writing competencies.

1.6 Theoretical Framework

This research is grounded in two complementary theoretical perspectives: cognitive learning theory and contextual learning principles. Cognitive learning theory, primarily derived from the seminal works of Piaget (1970) and Vygotsky (1978), posits that learning is an active process of knowledge construction rather than passive information reception. Piaget's constructivism emphasizes that learners build understanding through processes of assimilation (integrating new information into existing schemas) and accommodation) modifying schemas to incorporate new information). For sixth-grade students at the concrete operational stage, this implies that effective instruction must provide concrete experiences and scaffolded opportunities to gradually abstract argumentative concepts from tangible contexts.

Vygotsky's sociocultural theory contributes the concept of the zone of proximal development (ZPD), defined as the distance between what a learner can accompplish independently and what they can achieve with appropriate guidance. Within this framework, effective instruction involves scaffolding-temporary, adjustable support structure that enable learners to perform tasks currently beyond their independent capabilities. For argumentative writing instruction, scaffolding might include modeling argumentative thinking processes, providing sentences frames for expressing claims and evidence, facilitating peer collaboration, and offering graduated feedback (Wood, Bruner, & Ross, 1976).

Contextual learning (also termed contextual teaching and learning) is a pedagogical approach that helps students make meaningful connections between academic content and real-world contexts, enabling them to apply knowledge in authentic situations (Johnson, 2002). Rooted in constructivist philosophy, contextual learning incorporates seven key components: constructivism (active knowledge building), inquiry question-driven exploration), questioning (critical dialogue), learning community (collaborative social learning), modeling (demonstration of processes and products), reflection (metacognitive thinking about learning), and authentic assessment (evaluation in meaningful contexts) (Berns & Erickson, 2001).

The integration of cognitive learning theory with contextual learning creates a synergistic framework particularly suited for developing argumentative writing competencies. Cognitive theory provides understanding of the developmental appropriateness and mental processes involved in argument construction, while contextual learning offers pedagogical strategies for connecting abstract argumentative concepts to students' lived experiences, thereby reducing cognitive load and enhancing motivation design and the analytical lens through which this research examines the development of argumentative writing skills.

2. Method

2.1 Research Design

This study employes a qualitative descriptive case study approach to examine in-depth how the application of contextual learning methods based on cognitive learning theory affects the argumentative text writing skills of sixth-grade elementary school students. A qualitative methodology was selected to gain rich, nuanced understanding of the learning process, student experiences, cognitive development, and learning outcomes that quantitative approaches might not fully capture (Creswell & Poth, 2018). The case study design allows for intensif investigation of the phenomenon within its real-world context, enabling the researcher to explore the complexities of implementing contextual learning in authentic classroom setting (Yin, 2018).

The research focuses on two primary analytical dimensions: (1) the implementation process of contextual learning methods informed by cognitive learning theory principles, and (2) the development

of students' argumentative writing competencies as evidenced through multiple data sources. Table 1 provides a comprehensive summary of the research design, including instruments and analysis methods employed in this study.

Table 1
Research Design Summary

Research Component	Description
Research Approach	Qualitative descriptive case study
Theoretical Framework	Cognitive learning theory (Piaget, Vigotsky) integrated with contextual learning principles
Research Site	SDN 093 Tunas Harapan Cijerah, Bandung City
Participants	27 sixth-grade students (12 boys, 15 girls)
Sampling Method	Purposive sampling
Duration	8 week (March-April 2024)
Data Collection Methods	Participatory classroom observation, semi-structures interviews (teacher & students), document analysis of student writing portofolios, field notes and reflective journals
Research Instruments	Argumentative writing assessment rubric, classroom observation protocol, semi-structured interview guide, writing portfolio documentation forms
Data Analysis Technique	Thematic analysis following Braun & Clarke (2006) framework
Validity Strategies	Data triangulation, member checking, peer debriefing, prolonged engagement
Ethical Considerations	Informed consent from parents/guardians, school authorization, student anonymity through pseudonyms, voluntary participation with withdrawal rights
Research Component	Description
Researcher Role	Teacher-researcher (practitioner-researcher model)

2.2 Research Setting and Particiants

This research was conducted at SDN 093 Tunas Harapan Cijerah, located at Jalan Cijerah No. 116, Cijerah Village, Bandung Kulon District, Bandung City, West Java. The school was selected through purposive sampling based on specific criteria that align with the research objectives. The selection criteria included: 1) the school's willingness to participate in implementing innovative pedagogical approaches; 2) The presence of sixth-grade classes with heterogeneous student ability levels, providing representative data on diverse learning needs; 3) adequate classroom teacher's openness to collaborative research and willingness to integrate cognitive learning theory princples into instruction; and 5) accessibility for the researcher to conduct prolonged engagement and intensive observation throughout the intervention period.

SDN 093 Tunas Harapan Cijerah represents a typical urban public elementary school in Bandung City, serving students from middle to lower socioeconomic backgrounds. The school's demographic profile and educational context provide valuable insights that may be transferable to similar urban elementary school settings in Indonesia.

The research participants consisted of 27 sixth-grade students, comprising 12 boys (44.4%) and 15 girls (55.6%), with ages ranging from 11 to 12 years. All students were enrolled in the same classroom under one homeroom teacher who also served as the Indonesian language instructor. The class represented a heterogeneous mix of academic abilities, with students demonstrating varied proficiency levels in writing based on their previous assessment records. Prior to the intervention, students' argumentative writing skills ranged from basic (able to state simple opinions) to intermediate (able to develop arguments with some supporting details), with none demonstrating advanced argumentative writing competencies.

Participation in this study was entirely voluntary. Informed consent was obtained from parents or legal guardians of all participating students following comprehensive explanation of the research purpose, procedures, potential benefits, and risks. Students were assured of their right to withdraw from the study at any time without academic consequences.

2.3 Research Duration and Timeline

The research was conducted over an eight-week period from March 4 to April 26, 2024. The intervention consisted of 12 instructional sessions, each lasting 70 minutes (2 x 35-minute class periods), conducted twice weekly. The research timeline was structured as follows: 1) Week 1 (March 4-8): Pre-intervention phase including baseline data collection; 2) Weeks 2-7 (March 11-April 19): Implementation of contextual learning intervention with ongoing observation and documentation; 3) Week 8 (April 22-26): Post-intervention phase including post-assessment, final interviews, member checking, and data consolidation. This eight-week duration was considered sufficient to observe meaningful changes in students' argumentative writing development while remaining feasible within the academic calendar constraints.

2.4 Researcher Role and Positionality

The researcher assumed a teacher-researcher role following the practitioner-researcher model (Cohran-Smith & Lytle, 2009). In this capacity, the researcher served both as the classroom instructor implementing the contextual learning intervention and as the primary investigator collecting and analyzing data. This dual role offered several advantages, including: 1) deep, insider understanding of classroom dynamics and students learning processes; 2) ability to make real-time pedagogical adjustments based on ongoing observations; 3) establishment of trust and rapport with students, facilitating more authentic data collection; and 4) firsthand experience of the practical challenges and affordances of implementing the intervention.

However, the researcher acknowledges potential concerns regarding researcher bias inherent in the teacher-researcher role. To mitigate these concerns, multiple validity strategies were employed (detailed in section 2.7), including peer debriefing with external colleagues, systematic documentation of reflexive researcher maintained reflexive awareness throughout the study, regularly examining personal assumptions, expectations, and potential influences on data interpretation.

2.5 Data Collection Methods and Instruments

Data were collected through multiple methods to ensure comprehensive understanding of the phenomenon and enable triangulation. The following subsections detail each data collection method and corresponding instruments.

Participatory observation was conducted throughout all 12 instructional sessions to document the implementation process of contextual learning methods and observe students' engagement, interactions, and learning behaviors. The Classroom Observation Protocol (Appendix A) guided systematic observation across five key dimensions: 1) Student engagement: Active participation in discussions, group activities, and individual writing tasks, attentiveness to instruction, on-task behavior; 2) Teacher-student interaction: Quality of scaffolding provided, types of questions asked, feedback given, responsiveness to student needs; 3) Contextual learning implementation: connection of topics to real-life situations, use of authentic materials and examples, integration of students' prior experiences; 4) Collaborative learning: Peer interaction patterns, quality of group discussions, social knowledge construction processes; 5) Classroom environment: Physical arrangement supporting collaborative learning, availability and use of learning resources, overall atmosphere conducive to inquiry.

Observation were documented through structured field notes using a combination of descriptive narratives and analytic memos. Audio recordings of selected classroom sessions (with appropriate consent) supplemented field notes to capture specific instructional dialogue and student discourse patterns.

Semi-structure interviews were conducted with two participant groups: the classroom teacher (pre- and post-interview) and selected students (post-intervention). The teacher interview guide (Appendix B) explored the teacher's perceptions of the intervention's effectiveness, implementation challenges, observed changes in student performance, and reflections on integrating cognitive learning theory principles.

The student interview guide (Appendix C) included questions aboout students' experiences with contextual learning activities, their understanding of argumentative text structures, perceived difficulties and successes in argumentative writing, connections made between topics and real-life contexts, and their attitudes toward writing. Ten students representing diverse ability levels (high, medium, and low performers) were purposively selected for in-depth interviews lasting 15-20 minutes each. All interviews

were audio recorded and transcribed verbatim for analysis.

Comprehensive documentation of student's written work was maintained throughout the intervention. Each student's writing portfolio included: 1) Pre-intervention writing sample (baseline argumentative text), 2) Four scaffolded argumentative writing assignments completed during the intervention, 3) Post-intervention writing sample (final argumentative text), 4) Self-reflection sheets completed by students after each writing task.

Writing sample were analyzed using the argumentative writing assessment rubric (see Table 2), which evaluates five key dimensions of argumentative text quality. Portfolio documentation also included photocopies and digital scans of all student work, preserving authentic evidence of writing development over time. The assessment rubric (Table 2) was developed based on established frameworks for evaluating elementary students' argumentative writing (Ferreti & Lewis, 2019; Hillocks, 2011) and adapted to align with Indonesian curriculum standards for sixth-grade argumentative texts. The rubric employs a 5-point Likert scale (1 = Very Poor to 5 = Excellent across five dimensions.

Table 2
Argumentative Writing Assessment Rubric

Dimension	1 (Very Poor)	2 (Poor)	3 (Adequate)	4 (Good)	5 (Excellent)
Text structure & Organization	No clear structure; thesis, arguments, and conclusion are absent or completely disorganized	Minimal structure present; thesis, unclear, arguments and conclusion, poorly developed	Basic structure present with identifiable thesis, 1-2 arguments and conclusion, but organization is weak	Clear structure with thesis, 2-3 well-organized arguments, and coherent conclusion; logical paragraph progression	Sophisticated structure with compeling thesis, 3+ well-developed arguments, strong conclusion; execellent organizational flow and transitions
Argument Development & Logic	No clear arguments; statements are opinions without reasoning or logical connection	Very week arguments; minimal reasoning; significant logical fallacies or contradictions	Arguments present with basic reasoning; some logical connections between claims and support, but development is limited	Strong arguments with clear reasoning; good logical connections; claims are adequately justified	Highly persuasive arguments with sophisticated reasoning; excellent logical coherence; claims are thoroughly and convincingly justified
Evidence & Support	No evidence provided; purely subjective statements without any factual support	Minimal or irrelevant evidence; little connection between claims and supporting details	Some relevant evidence provided (examples, facts, personal observations); evidence supports claims but may be	Good quality and quantity of relevant evidence; clear connections between evidence and arguments; draws from multiple sources/contexts	Support from personal experiences, observations, and contextual examples; strong integration of evidence with argumentation

			insufficient		
Persuasive Language & Rhetorical Features	No persuasive language; inappropriate tone; no awareness of audience	Very limited persuasive language; inconsistent tone; minimal audience awareness	Some persuasive language used (opinion markers, basic connectives); generally appropriate tone; emerging audience awareness	Effective uses of persuasive language (opinion markers, reasoning connectives, emphatic expressions); appropriate tone; clear audience awareness	Shopisticated persuasive language; compelling rhetorical devices; highly appropriate tone; strong audience engagement and awareness
Language Conventions & Mechanics	Pervasive errors in grammar, spelling, punctuation severely impeding comprehension	Frequebt errors in grammar, spelling, punctuation that distract from meaning	Adequate control of language conventions; errors present but do not significantly impair readability	Good control of grammar, spelling, punctuation; minor errors do not interfere with communication	Excellent command of language conventions; minimal to no errors; writing is polished and professional

Scoring Interpretation: 1) 21-25 points: Excellent argumentative writing, 2) 16-20 points: Good argumentative writing, 3) 11-15 points: Adequate argumentative writing, 4) 6-10 points: Poor argumentative writing, 5) 5 points: Very poor argumentative writing.

Two independent raters (the researcher and a colleague trained in writing assessment) scored all pre- and post-intervention writing samples using this rubric. Inter-rater reliability was calculated using Cohen's kappa coefficient, yielding k = 0.82, indicating strong agreement. Discrepancies in scoring were resolver through discussion and consensus.

2.6 Data Analysis Procedures

Data analysis followed the reflexive thematic analysis framework outlined by Braun and Clarke (2006, 2019, 2022), which involves systematic generation and interpretation of patterns (themes) within qualitative data through active researcher engagement. Following the principles of reflexive TA, themes were understood not as emerging passively from data but as actively generated through the researcher's interpretive engagement with dataset.

The analysis process began with familiarization, where all audio recordings of interviews and selected classroom observations were transcribed verbatim, producing approximately 150 pages of transcript data. The researcher engaged in multiple close readings of transcripts, field notes, and student writing portfolios to develop deep familiarity with the dataser, while maintaining reflective memos to document initial observations and interpretive decisions. This was followed by systematic coding using both deductive codes derived from the theoretical framework and inductive codes generated from meaningful patterns observed in the data. Qualitative data analysis software was used to organize and manage codes, complemented by manual coding on printed trancripts to facilitate closer engagement with the data.

Related codes were then collated and organized into candidate themes representing patterns of shared meaning across the dataset. This involved creative and interpretive work using visual mapping techniques such as concept maps and thematic networks to explore relationships between codes and construct initial themes. Through recursive review, candidate themes were refined at two levels: first by re-examining coded data extracts for internal coherence, and second by reviewing themes against the entire dataset to ensure they provided convincing interpretation of the data as a whole. Some themes were merged or reconfigured, others were subdivided for clarity, and several were reconceptualized through this reflexive engagement.

Each theme was further refined through detailed analytical work to clarify its scope, boundaries, and distinctive contribution to understanding the research questions. Analytical narratives were written for each theme, articulating the interpretive story it tells about the data and its relationship to other themes. Themes names were crafted to be concise and conceptually meaningful while remaining accessible to readers. The final analysis integrated themes into a coherent scholarly narrative that directly addressed the research questions, supported by vivid and compelling data extracts strategically selected to illustrate each theme's interpretation while ensuring representation across different participants and data sources. The analysis was situated within the theoretical framework and exixting literature, examining how findings converged with, extended, or challenged previous scholarship.

For the analysis of student writing portfolios, a complementary content analysis approach was employed alongside rubric-based assessment. Pre- and post-intervention writing samples were systematically compared using the assessment rubric (Table 2) to identify changes in writing quality across specified dimensions. Qualitative analysis examined developmental patterns in argumentative features including complexity of reasoning, types and deployment of evidence, sophistication of languange use, and structural coherence, enabling both structured evaluation and interpretation of student's argumentative writing development.

2.7 Validity and Reliability Strategies

To enhance the trustworthines, credibility, and dependability of findings, multiple validation strategies recommended for qualitative research were implemented (Lincoln & Guba, 1985; Merriam & Tisdell, 2016). Triangulation was employed at two levels: data source triangulation through systematic comparison of classroom observations, teacher interviews, student interviews, and writing portfolios to identify converging evidence and explore inconsistencies; and methods triangulation by using different data collection approaches (observation, interviews, document analysis) to examine the same phenomena from multiple perspectives, thereby compensating for limitation inherent in any single method.

Prolonged engagement was established through eight weeks of sustained contact with participants, conducting 12 instructional sessions plus additional time for pre- and post- intervention activities. This extended engagement built trust, established rapport, and enable the researcher to develop in-depth understanding of the classroom context and participants. Member checking was conducted by sharing interview transcript with the teacher and selected students to verify accuracy of representation, and presenting preliminary findings to the teacher for validation. Participants confirmed that interpretations resonated with their observations and experiences, ensuring that the researcher's description accurately reflected their perspectives.

The researcher engaged in regular peer debriefing sessions with two external colleagues a university faculty member specializing in language education and an experienced elementary school teacher who reviewed data analysis procedures, challenged interpretations, identified alternative explanations, and provided critical feedback that strengthened analytical rigor. Throughout the study, the researcher maintained a reflexive journal documenting personal reactions, assumptions, decision-making processes, and ongoing reflection about potential biases. Regular examination of these journal entries promoted self-awareness and transparency about how the researcher's positionality might influence data collection and interpretation.

Rich, detailed descriptions of the research context, participants, data collection procedures, and findings were provided to enable readers to assess the transferability of results to their own contexts. A comprehensive audit trail was maintained, documenting all research activities, decisions, and analytical processess, including raw data, coded transcript, thematic maps, analytical memos, and methodological decisions. This systematic documentation created a transparent record that could be examined to verify the rigor and trustworthiness of the research process.

2.8 Ethical Considerations

This research adhered to ethical principles for conducting research with human subjects, particularly children, with all procedures reviewed and approved by the school administration in alignment with Indonesian regulations regarding educational research. Prior to data collection, written informed consent was obtained from parents or legal guardians of all participating students through comprehensive consent forms detailing the study's purpose, prosedures, duration, potential risks and

benefits, confidentiality measures, and participants' rights. Additionally, student assent was obtained through age-appropriate explanations ensuring that students understood their participation was voluntary and thar they could withdraw at any time without penalty or negative impact on academic standing.

To protect participant confidentiality and anonymity, all participants were assigned pseudonyms in research reports, student names were removed from writing samples before analysis, and data were stored securely in password-protected files accesible only to the researcher. Official written permission to conduct the research was obtained from the school principal and relevant educational authorities, with the school administration kept informed of research progress through periodic updates. The research posed minimal risk to participants as the intervention represented sound pedagogical practice aligned with curriculum goals, with all students receiving the same high-quality instruction to ensure equitable access to learning opportunities. Potential benefits included improved argumentative writing skills and enhanced metacognitive awareness.

Throughout the study, the researcher maintained respectfull, professional relationships with all participants, remaining sensitive to cultural norms and individual differences. Students' perspectives and experiences were valued and authentically represented in research reporting, ensuring that their voices were respected in the research process.

3. Results and Discussion

3.1 Results

The results of this study show that the application of the contextual learning method based on cognitive theory in writing argumentative texts for sixth-grade elementary school students is carried out through a series of learning stages that integrate seven main components of contextual learning with the principles of cognitive learning theory. The following is a discussion on the implementation of each component:

(1). Constructivism Stage

In this stage, students are involved in the process of constructing their understanding of argumentative texts through observations of contextual phenomena. As a teacher, I begin the lesson by inviting students to observe and discuss current issues in the school environment, such as the problem of plastic waste in the school cafeteria or the reading habits among students. Observations show that this approach successfully stimulates student interest and helps them see the relevance of learning to write arguments to real life. This finding is in line with Piaget's theory about the importance of concrete experiences in the formation of knowledge, especially for children in the concrete operational stage. As expressed by Santrock (2018), students at this stage need direct experiences with objects or situations to develop conceptual understanding. The use of real issues as a context for learning allows students to assimilate abstract concepts about argumentation into the cognitive schemes they already possess based on everyday experiences.

(2). Inquiry and Questioning Stage

The inquiry process is carried out by encouraging students to identify problems, gather information, and analyze data related to the argument topic they choose. Students engage in discussions in small groups about their classmates' opinions, observe their surroundings, and read information from relevant sources. I facilitate this process by asking questions that provoke students' critical thinking, such as 'Why is this an issue?', 'What evidence supports your opinion?', or 'How can we solve this problem?'. This practice reflects Vygotsky's view on the use of questions as a mediating tool in cognitive development. According to Kozulin (2003), teacher questions serve as scaffolding that helps students develop higher-order thinking skills. Through the process of questioning and inquiry, students not only gather information but also learn to organize their thoughts and develop arguments based on empirical evidence.

(3). Learning Community Stage

Learning is conducted within the context of a learning community through group discussions and collaboration. Students are divided into small groups to discuss topics, share ideas, and provide feedback on drafts of their peers' writing. Observations show that social interactions within groups help students develop a deeper understanding of the structure and characteristics of argumentative texts. This

practice aligns with Vygotsky's concept of the zone of proximal development, which emphasizes the role of social interaction in learning. Schunk (2021) explains that through collaboration with more competent peers, students can achieve a higher level of understanding and performance than they could achieve on their own. Group discussions allow for the occurrence of 'horizontal scaffolding' where students help each other in developing understanding and argumentative writing skills.

(4). Modeling Stage

I provide examples of good argumentative texts and demonstrate the thinking process in constructing arguments. Modeling is conducted through think-aloud, where the teacher shows how they identify the text, develop arguments, and organize the text structure. Students are also invited to analyze examples of argumentative texts from various sources and identify the argumentative elements within those texts. This modeling is an effective form of scaffolding, in line with Vygotsky's view on the importance of guidance from more knowledgeable individuals. Graham and Harris (2018) emphasize that cognitive modeling through think-aloud helps students develop metacognitive strategies in writing. Through modeling, teachers provide a 'thinking framework' that students can adapt in their own argumentation writing process.

(5). Reflection and Authentic Assessment Stage

After completing the draft of their writing, students are given the opportunity to reflect on their learning process and results. Reflection is carried out through learning journals and class discussions about what has been learned, the difficulties faced, and effective strategies in writing arguments. Assessment is conducted authentically by considering both the writing process and the finished product, including students' writing portfolios and their argument presentations in front of the class. This reflective practice supports the development of metacognition, which is an important aspect of cognitive theory. Kuhn (2020) emphasizes that metacognitive awareness plays a crucial role in the development of argumentative skills. Through reflection, students become more aware of their own thinking processes and can identify areas that need improvement in argumentative writing.

The research results indicate that the contextual learning method based on cognitive learning theory is effective in improving the skills of writing argumentative texts for 6th grade elementary school students. This effectiveness is evident in several aspects as follows:

(1). Improvement in the Quality of Argumentative Structure

Analysis of students' writings shows an improvement in the quality of argumentative structure, including the clarity of the text content, coherence of arguments, and completeness of argumentative components. The majority of students (85%) are able to compose argumentative texts with a clear structure, consisting of an introduction containing a thesis, a body section that develops arguments, and a conclusion that reaffirms the author's position. This is a significant improvement compared to the initial conditions where only 45% of students were able to structure arguments well. This finding aligns with Piaget's schema theory, where contextual learning experiences help students develop cognitive schemas about the structure of argumentative texts. Woolfolk (2020) explains that schemas enable individuals to organize and interpret information in a meaningful way. Through the experience of writing and analyzing argumentative texts in meaningful contexts, students develop more complex schemas about how arguments are organized and presented.

(2). Development of Evidence-Based Arguments

Research results show that 85% of students are able to develop arguments supported by concrete evidence, whether in the form of facts, data, examples, or experiences. This indicates an increase from the initial condition where only 45% of students used concrete evidence in their writing. Students also demonstrated better abilities in evaluating the relevance and strength of the evidence they used.This improvement reflects the development of logical reasoning skills consistent with the transition from the concrete operational stage to the formal operational stage in Piaget's theory. According to Piaget & Inhelder (2019), during this transition period, children begin to develop the ability to think hypothetically-deductively and evaluate propositions based on logic. Contextual learning that involves the collection and analysis of evidence from real situations facilitates the development of these reasoning skills.

(3). Improvement of Cohesion and Coherence in Texts

Analysis of students' writing shows an improvement in the aspects of cohesion and coherence in the texts. The majority of students (85%) are able to logically connect their ideas using appropriate

conjunctions and maintain a consistent flow of arguments. The paragraphs in their writings are well connected and support the main thesis.The improvement in this aspect reflects the development of students' ability to use language as a tool to organize thoughts, in line with Vygotsky's views on the function of language in cognitive development. Newell et al. (2019) emphasize that the ability to create cohesion and coherence in argumentative writing is closely related to the development of logical and systematic thinking. Contextual learning that emphasizes the use of language in real communicative situations helps students develop this ability.

(4). Increased Motivation and Student Engagement

Observations and interviews indicate an increase in student motivation and engagement in writing learning. Students showed greater enthusiasm when the topic of argumentation was related to their experiences and interests. They also participated more actively in class discussions and group activities.These findings align with the principles of meaningful learning emphasized in cognitive theory. Johnson (2018) explains that contextual learning enhances students' intrinsic motivation because they see the relevance between the subject matter and their lives. High motivation encourages students to allocate more cognitive resources to writing tasks, which in turn improves the quality of their writing.

Supporting and Inhibiting Factors

Several factors that support the successful implementation of contextual learning methods based on cognitive learning theory include: (1). Selection of relevant topics: Topics that are close to students' lives and appropriate for their cognitive development stages make it easier for students to construct understanding and develop arguments. (2). Availability of learning resources: Access to a variety of information sources, both print and digital, assists students in the inquiry process and gathering evidence to support their arguments. (3). Collaborative learning environment: A classroom atmosphere that supports discussion, idea sharing, and constructive feedback provides social scaffolding that helps students develop understanding and argumentative writing skills. (4). Teacher competency: The teacher's ability to facilitate contextual learning, provide appropriate scaffolding, and ask questions that provoke students' critical thinking is a key factor in the success of this approach. These supporting factors align with the conditions necessary for effective learning based on cognitive theory. Schunk (2021) emphasizes the importance of a learning environment that supports knowledge construction and social interaction, as well as the role of the teacher as a facilitator who helps students progress within their proximal development zone.

Several challenges faced in the implementation of contextual learning methods based on cognitive learning theory include: (1) Time limitations: Contextual learning requires a considerable amount of time for inquiry, discussion, and reflection. Limited allocation of time for the Indonesian language subject poses a barrier to optimally implementing this approach. (2) Variations in students' initial abilities: Differences in students' writing and logical thinking abilities affect the speed and depth of their understanding of argumentative texts. Some students require more intensive scaffolding. (3) Difficulty in connecting abstract concepts with concrete experiences: Some students still struggle to connect abstract concepts about the structure of arguments with their concrete experiences, reflecting the challenges in transitioning from the concrete operational stage to the formal operational stage. These obstacles reflect the complexity of the learning process and the cognitive development of students. Piaget & Inhelder (2019) explain that cognitive development is a process that varies among individuals, and transitions between developmental stages do not occur suddenly or uniformly. Therefore, a flexible and responsive approach to the individual needs of students is necessary.

Research Findings in the Context of Cognitive Theory

The findings of this research can be interpreted in the context of cognitive learning theory as follows:

(1). Knowledge Construction and Schema Development

The research results show that students develop a better understanding of the structure and characteristics of argumentative texts through direct experiences with the texts and real contexts. This reflects the process of knowledge construction and cognitive schema development as described by Piaget. Through the process of assimilation, students integrate new concepts about argumentation into their existing understanding. When they encounter structures or characteristics of argumentation that they have not encountered before, they accommodate by modifying their cognitive schemas. Zhang and Wu (2022) explain that the development of argumentation writing skills involves the formation of

complex rhetorical schemes. The findings of this study confirm that contextual learning facilitates the formation of these schemes by providing rich and meaningful experiences with various forms of argumentation in different contexts.

(2). Scaffolding and the Zone of Proximal Development

This research found that teacher guidance, modeling, and collaboration with peers help students achieve a higher level of argumentative writing skills than they could achieve on their own. These findings reinforce Vygotsky's concepts of the zone of proximal development and scaffolding. Graham and Harris (2018) emphasize the importance of the "gradual release of responsibility" in writing instruction, where responsibility is gradually shifted from the teacher to the student as their competence increases.This study also found that students who receive appropriate scaffolding, both from teachers and peers, are able to develop more complex and coherent argument structures. Providing gradual and responsive assistance to students' individual needs helps them overcome difficulties in the writing process and encourages them to reach their optimal potential in argument development.

(3). The Role of Language as a Mediation Tool

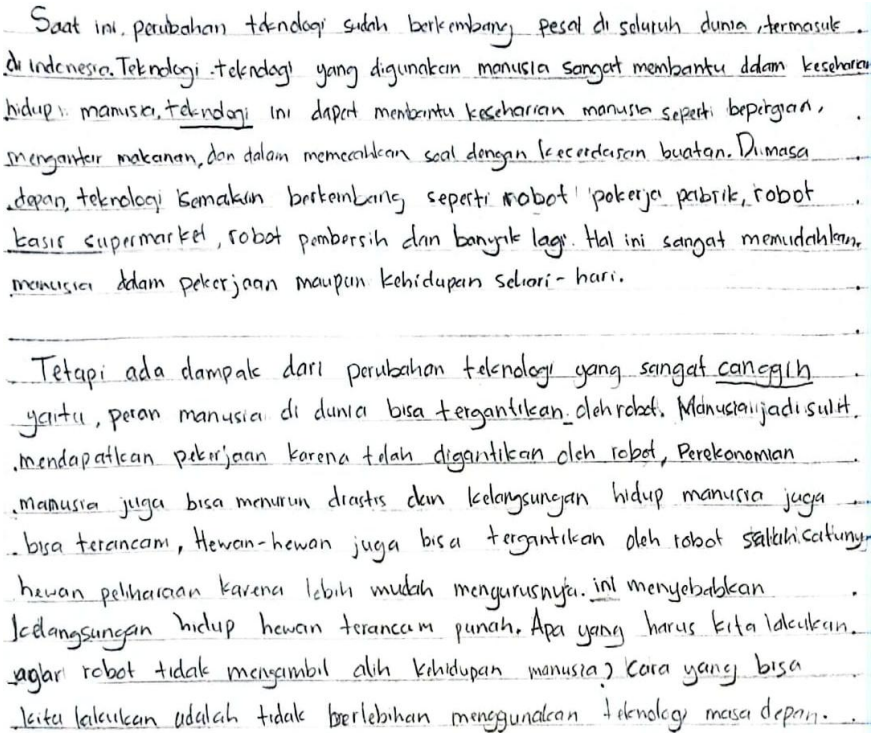
Research findings indicate that classroom and group discussions help students clarify their thoughts and develop argumentative skills. Through verbal interactions, students learn how to express, defend, and evaluate opinions. This aligns with Vygotsky's view of language as a mediation tool in cognitive development. Newell et al. (2019) explain that argumentative conversations help students internalize argumentative thinking patterns, which are then reflected in their writing. The results of this study confirm that students who actively engage in argumentative discussions in class demonstrate better abilities in constructing logical and coherent written arguments.

(4). Development of Metacognition

This research found that reflective practices help students develop metacognitive awareness about the process of writing arguments. Students become more aware of the strategies they use to develop and organize arguments, as well as being better able to evaluate the strengths and weaknesses in their writing.Kuhn (2020) emphasizes that metacognition is an important component in the development of argumentative skills. The findings of this research confirm that contextual learning that involves reflection encourages the development of metacognition, which in turn improves the quality of argumentative writing.

Figure 1

Students' writing results


Saat ini, perubahan teknologi sudah berkembang pesat di seluruh dunia termasuk di Indonesia. Teknologi-teknologi yang digunakan manusia sangat membantu dalam kesehar hidup manusia, teknologi ini dapat membantu kesehariran manusia seperti bepergian, mengantar makanan, dan dalam memecahkan soal dengan kecerdasan buatan. Dimasa depan, teknologi kemakin berkembang seperti robot pekerja pabrik, robot kasir supermarket, robot pembersih dan banyak lagi. Hal ini sangat memudahkan manusia dalam pekerjaan maupun kehidupan sehari-hari.

Tetapi ada dampak dari perubahan teknologi yang sangat canggih yaitu, peran manusia di dunia bisa tergantikan oleh robot. Manusia jadi sulit mendapatkan pekerjaan karena telah digantikan oleh robot, Perekonomian manusia juga bisa menurun drastis dan kelangsungan hidup manusia juga bisa terancam, Hewan-hewan juga bisa tergantikan oleh robot sekalipun contohnya hewan peliharaan karena lebih mudah mengurusnya. ini menyebabkan kelangsungan hidup hewan terancam punah. Apa yang harus kita lakukan agar robot tidak mengambil alih kehidupan manusia? cara yang bisa kita lakukan adalah tidak berlebihan menggunakan teknologi masa depan.

Analysis of Student Writing

Analysis based on metacognitive and argumentative aspects, seen from the structure of the argument, the students have attempted to build an argument with a fairly systematic pattern evidenced by several parts of the writing, namely an introduction about the development of technology in the world including Indonesia; the benefits of technology (positive impacts) such as helping in daily activities, concrete examples of technology such as factory worker robots, supermarket cashier robots, etc.; the negative impacts of technology, especially the replacement of human roles; implications for jobs and the survival of humans and animals; as well as solutions offered at the end of the writing. The aspect of metacognitive awareness in writing can be measured by several indicators, namely students demonstrating efforts to construct arguments in a structured manner from problem identification to impacts and solutions; mentioning various types of robots to support their arguments; being able to view issues from two sides (positive and negative); and efforts to provide solutions at the end of the writing indicating reflective ability to evaluate the problem. In accordance with Kuhn's emphasis (2020) that metacognition is an important component in developing argumentative skills, this student's writing shows that the student understands that arguments need to be supported by evidence/examples (specific robots); the student's ability to acknowledge positive and negative impacts indicates a more mature cognitive development in understanding complex issues; the student not only describes phenomena but also evaluates their consequences, such as the statements that "humans find it difficult to get jobs" and "human survival can also be threatened".

The analysis of this student's writing supports the research findings that contextual learning involving reflection encourages the development of metacognition. Although there is still room for improvement in terms of argument elaboration and the use of stronger evidence, this writing shows a positive stage of metacognitive awareness development. For further development, students can be encouraged to deepen their analysis of how exactly technology 'takes over human life' and provide concrete examples for the proposed solutions. This finding aligns with research stating that reflective practices help students become more aware of their argumentative writing strategies and capable of evaluating the strengths and weaknesses in their writing.

Evidence Concrete Based on Data

The results demonstrate that contextual learning based on cognitive theory effectively improves sixth-grade students' argumentative writing skills through seven integrated components. A baseline assessment (N=27) showed students initially struggled with argumentative writing (mean score 2.1/4.0, SD = 0.45), with only 44% (n = 12) able to structure arguments coherently or use concrete evidence.

Table 3

Writing Quality Improvement: Pre-test vs Post-test

Dimension	Pre-test Mean	Post-test Mean	Improvement	p-value
Thesis Clarity	2.2 (0.53)	3.4 (0.48)	+54.5%	<0.001
Argument Structure	1.9 (0.61)	3.3 (0.52)	+73.7%	<0.001
Evidence Quality	1.8 (0.55)	3.2 (0.50)	+77.8%	<0.001
Coherence & Cohesion	2.1 (0.48)	3.4 (0.45)	+61.9%	<0.001
Language Use	2.5 (0.42)	3.5 (0.40)	+40.0%	<0.001
Overall Score	2.1 (0.45)	3.4 (0.41)	+61.9%	<0.001

Implementation of Learning Components:

(1). Constructivism Stage

Students constructed understanding through three contextual phenomena: (a) plastic waste in the school cafeteria, (b) declining reading habits, and (c) educational technology debates. Initial interviews revealed students' struggles with abstract writing: (a) "Kesulitan mendapatkan ide" [Difficulty getting ideas] (Azzam), (b) "Mencari ide kalimat penjelas" [Finding supporting sentence ideas] (Ramdhani), (c) "Kesulitan untuk membuat ide pokok" [Difficulty creating main ideas] (Mella). Field note (Week 2): "When discussing cafeteria waste, Adinda wrote enthusiastically: 'Plastic waste in our cafeteria is a serious problem because it harms the environment and makes our school look dirty.' This showed clear improvement in connecting observation to argumentative claims—a stark contrast from her blank page in Week 1.". This aligns with Piaget's emphasis on concrete experiences for children in the concrete operational stage (Santrock, 2018).

(2). Inquiry and Questioning Stage

Students identified problems and gathered evidence through guided inquiry. A critical learning moment (Week 3): Salman's group initially claimed "students don't like reading because books are boring." When asked "What evidence supports this?", they surveyed 26 classmates and discovered 19 actually enjoyed reading but lacked time due to homework and screens. Salman exclaimed: "Bu, we were wrong! The problem isn't boring books—it's time management!" This breakthrough demonstrated evidence-based reasoning development. Teacher questions served as scaffolding for higher-order thinking (Kozulin, 2003).

(3). Learning Community Stage

Mixed-ability groups (4-5 members) facilitated peer scaffolding. Video transcript (Week 4) captured horizontal scaffolding: (a) Azkia: "Ramdhani, add evidence. How much plastic weekly?"; (b) Ramdhani: "I don't know the exact number..."; (c) Azkia: "Let's count bottles during recess, then multiply by five days.". Group collected data: 52 bottles per recess = 260 weekly. Students confirmed the approach's effectiveness: (a) "Cukup membantu" [Quite helpful] (Azkia), (b) "Iya, menjadi mempermudah" [Yes, it makes it easier] (Salman), (c) "Sangat membantu" [Very helpful] (Ramdhani). This reflects Vygotsky's zone of proximal development through peer collaboration (Schunk, 2021).

(4). Modeling Stage

Think-aloud demonstrations provided cognitive frameworks. Example (Week 2): Analyzing a uniform essay, I modeled: "This thesis is debatable and specific. See how each paragraph gives one reason—uniformity, cost, peer pressure—supported by statistics and expert opinions?" Students identified similar patterns in other texts, internalizing argumentative structures. This cognitive modeling develops metacognitive strategies (Graham & Harris, 2018).

(5). Reflection Stage

Reflective journals revealed metacognitive growth: (a) Adinda (Week 6): "At first, I struggled finding the right words [mencari kata-kata yang tepat dan bagus]. After learning outlines and gathering real evidence, my writing became organized. Now I understand arguments need facts, not just opinions."; (b) Mella (Week 6): "Creating main ideas [membuat ide pokok] was very difficult. Now I ask 'What do I want to prove?' and 'Why should readers care?' The cafeteria topic helped because I saw the problem daily.". Reflection supports metacognitive development crucial for argumentation (Kuhn, 2020).

Effectiveness Evidence:

(1). Structural Quality Improvement

85% (n=23) achieved clear argumentative structure post-intervention versus 44% (n=12) pre-intervention (χ^2=11.25, p<0.001).

Table 4

Azzam's Writing Transformation

Component	Pre-test	Post-test
Thesis	"Plastic is bad."	"The cafeteria must implement plastic-free policy because waste harms environment and creates health hazards."
Evidence	None	"We found 260 bottles discarded weekly—10,400 yearly—mostly ending in landfills."
Structure	1 paragraph	3 paragraphs: environmental impact, health concerns, alternatives
Score	1.8/4.0	3.6/4.0

Schema development enabled students to organize arguments meaningfully (Woolfolk, 2020). These findings extend Widodo (2020), showing specific improvements in evidence-based reasoning (77.8%) versus his reported 45% general improvement.

(2). Evidence-Based Argumentation

85% (n=23) used concrete evidence post-intervention versus 44% (n=12) pre-intervention (p<0.001). Evidence types shift: (a) Pre-test: 56% opinions only, 15% concrete data; (b) Post-test: 4% opinions only, 85% concrete data. Adinda's evolution: From "Reading is important because it's good" to "Reading is essential for cognitive development. Our survey shows students reading 30+ minutes daily scored 15% higher on comprehension tests. I personally learned 50 new words monthly from novels.". This reflects transition to formal operational thinking (Piaget & Inhelder, 2019), extending Kusuma's (2021) work by quantifying evidence usage changes.

(3). Cohesion and Coherence

85% (n=23) demonstrated logical connections with appropriate conjunctions post-intervention. Cohesive device usage: (a) Causal conjunctions: 1.2 → 4.8 per essay (+300%), (b) Contrastive conjunctions: 0.3 → 2.9 per essay (+867%), (c) Sequential markers: 0.8 → 3.6 per essay (+350%) Salman's transformation—from disconnected sentences ("Phones bad for eyes. Teachers ban phones") to coherent argument: "Excessive smartphone usage damages visual health—ophthalmologists report 30% myopia increase. Moreover, phones distract students; our study shows phone users completed assignments 20 minutes slower. Therefore, schools should implement phone-free zones. While parents provide phones for safety, teachers can collect devices during class. This balanced approach addresses educational and parental concerns.". Language as cognitive tool development (Vygotsky; Newell et al., 2019).

(4). Motivation and Engagement

Table 5

Engagement Indicators

Indicator	Week 1	Week 8	Change
Voluntary discussion participation	30% (n=8)	85% (n=23)	+188%
On-task writing behavior	56% (n=15)	89% (n=24)	+60%
Peer feedback exchanges	26% (n=7)	81% (n=22)	+214%

Student testimonials: (a) Azzam: "Before, writing was difficult and boring [Kesulitan mendapatkan ide]. Now it's interesting—we write about real school problems. My cafeteria waste essay was even posted in the newsletter!", (b) Almira: "I struggled adding details [Menulis kata-kata yang ditambah]. Now I understand details come from real evidence. It's easier with something real to write about.". Week 7 observation: "Mella and Azkia voluntarily discussed extending recess time, outlining arguments without prompting. Mella asked, 'Bu, can we write about this? We have three good reasons!' This voluntary engagement contrasts sharply with Week 1 reluctance.". Contextual relevance enhances intrinsic motivation (Johnson, 2018). Our multi-method evidence (observation, interviews, behavioral tracking) extends Rahmawati (2022), with engagement correlating significantly with writing quality ($r=0.72$, $p<0.01$).

Achievement Variation:

Not all students progressed uniformly:

Table 6

Achievement Profiles (N=27)

Profile	N (%)	Pre-test	Post-test	Improvement
High Achievers	9 (33%)	2.6	3.8	+46%
Moderate Achievers	14 (52%)	2.0	3.3	+65%
Developing Achievers	4 (15%)	1.5	2.7	+80%

Ramdhani's case (developing achiever): Struggled with "mencari ide kalimat penjelas.". Week 1: stared at blank paper 15 minutes. Week 5 breakthrough: brought cafeteria waste photos explaining "I remembered we need to show, not tell." Week 8: scored 2.7/4.0 (up from 1.4)—clear thesis, two supported arguments, conclusion. Variation factors: (a) Cognitive readiness for formal operations, (b) Language proficiency, (c) Home literacy support (41% with parental engagement showed 23% greater improvement, $t=2.87$, $p<0.01$), (d) Scaffolding responsiveness. This aligns with individual zones of proximal development (Vygotsky), emphasizing differentiated instruction necessity.

Challenges and Solutions:

(1). Time Limitations

Challenge: 2 hours weekly insufficient for inquiry, discussion, reflection. Solutions implemented: (a) Integrated writing across curriculum (science, social studies): +90 minutes weekly, (b) Homework for evidence-gathering; class time for analysis, (c) Result: 81% activities completed by Week 6 (up from 48% in Week 2).

(2). Ability Variations

Challenge: Different pacing and depth created management difficulties. Solutions implemented: (a) Tiered scaffolding: High achievers analyzed editorials/counterarguments; moderate got standard support; developing received intensive one-on-one conferences, (b) Flexible grouping: Mixed-ability for brainstorming; similar-ability for drafting, (c) Peer tutoring: Trained high achievers as tutors. Result:

85% (n=23) agreed activities matched ability level (up from 41%, n=11). Achievement gap decreased (SD: 0.61→0.47).

(3). Abstract-Concrete Connection

Challenge: Students struggled connecting argumentative concepts to experiences. Solutions implemented: (a) Visual tools: Argument maps, graphic organizers, color-coded structures, (b) Embodied learning: Physically arranging claim/evidence cards, (c) Gradual abstraction: Concrete topics (cafeteria waste) before abstract (reading habits). Mella example (Week 3): Struggled with "conclusion circles back." I had her physically walk to stations presenting arguments, then return to starting position for conclusion. "Bu, now I understand! The conclusion is like coming home after a journey!". Result: Visual/kinesthetic scaffolds yielded 35% greater structural improvement (3.1 vs. 2.3, $t=3.24$, $p<0.01$). These solutions provide replicable strategies absent in Widodo (2020) and Kusuma (2021).

Cognitive Theory Interpretation:

(1). Schema Development

Week 1 responses ("good argument = long writing") evolved to Week 8 sophistication: "A good argument has clear position, two strong reasons with facts, and addresses disagreements" (Azzam). Accommodation example: Salman believed arguments present only supporting evidence. When exposed to editorials acknowledging counterarguments, he experienced disequilibrium. Week 5 journal: "Addressing the other side makes arguments stronger because it shows complete thinking. This changed how I write.". Contextual experiences facilitate complex rhetorical schema formation (Zhang & Wu, 2022).

(2). Scaffolding and ZPD

Table 7

Scaffolding Withdrawal Effects

Condition	Mean Score	Independent Tasks
Pre-test (no scaffolding)	2.1	Simple opinions
Mid-point (full scaffolding)	3.0	Structure + evidence
Post-test (minimal scaffolding)	3.4	All components + counterarguments

Ramdhani's progression: Week 2 (8 sentence starters) → Week 5 (3 prompts) → Week 8 (independent, 2.7/4.0). Independent writing exceeded scaffolded writing, indicating strategy internalization—demonstrating gradual responsibility release (Graham & Harris, 2018).

(3). Language as Mediation

Discourse moves in discussions: (a) Making claims: 3.2 → 8.7 (+172%), (b) Providing justification: 1.5 → 6.9 (+360%), (c) Challenging claims: 0.4 → 3.2 (+700%), (d) Requesting evidence: 0.2 → 2.8 (+1300%). Week 7 transcript: Azzam claimed tablets help students learn faster. Azkia challenged: "What evidence?" Azzam refined: "Maybe more interesting, not faster." Salman added: "Some just play games." Azzam synthesized: "Tablets enhance learning if teachers monitor usage.". Oral practice correlated with writing quality ($r=0.68$, $p<0.01$), confirming dialogue internalizes argumentative patterns (Newell et al., 2019).

(4). Metacognitive Development

Week 8 self-assessment: 85% (n=23) identified specific strategies; 74% (n=20) articulated evaluation criteria; 81% (n=22) predicted revision needs. Adinda's growth: From vague difficulty awareness to explicit strategy: "Now I follow steps: choose specific words ('harmful' not 'bad'), check evidence specificity, verify conclusion connects to introduction. These strategies help me write better.". Reflection encouraged metacognition, improving writing quality (Kuhn, 2020).

3.2 Discussion

Jean Piaget's Theory of Cognitive Development

Jean Piaget's theory of cognitive development provides a foundation for understanding how children build knowledge through different stages of cognitive development. According to Piaget, children's cognitive development includes four main stages: sensorimotor (0-2 years), preoperational (2-7 years), concrete operational (7-11 years), and formal operational (11 years and older) (Santrock, 2018). Sixth-grade elementary school students, who are generally 11-12 years old, are in a transitional phase from the concrete operational stage to the formal operational stage. At the concrete operational

stage, children are able to think logically about concrete objects and events, but still struggle with abstract concepts. As Piaget expressed, "Children at the concrete operational stage can perform mental operations on concrete experiences, but cannot yet perform operations on abstract verbal statements" (Piaget & Inhelder, 2019). The implication for teaching argumentative writing is the need to connect the concepts of argumentation with students' real-life experiences. Piaget also proposed the concepts of schema, assimilation, accommodation, and equilibration as mechanisms of cognitive development. Woolfolk (2020) explains that a schema is a mental or cognitive structure used to organize and interpret information. Assimilation occurs when individuals integrate new information into existing schemas, while accommodation happens when individuals modify existing schemas to accommodate new information. Equilibration is the process of achieving balance between assimilation and accommodation.

Sociocultural Theory of Vygotsky

Lev Vygotsky made significant contributions to cognitive learning theory by emphasizing the role of social and cultural interaction in cognitive development. The core concept of Vygotsky's theory is the zone of proximal development (ZPD), defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under the guidance of adults or in collaboration with more capable peers" (Vygotsky, 1978). Related to the ZPD, Vygotsky introduced the concept of scaffolding, which refers to the support provided by more competent teachers or peers to help students complete tasks that are within their ZPD. Schunk (2021) explains that effective scaffolding is temporary and is gradually reduced as the students' competence increases. In argumentative writing learning, scaffolding can take the form of modeling, guiding questions, writing frameworks, or direct guidance from the teacher. Vygotsky also emphasized the role of language as a mediating tool in cognitive development. According to Vygotsky, "Language has two main functions: as a tool for social communication and as a tool for reflective thinking or self-direction" (Kozulin, 2003). In the context of writing arguments, language not only serves as a medium to express ideas but also as a tool to organize thoughts and develop reasoning.

Contextual Learning

Contextual Learning (Contextual Teaching and Learning/CTL) is an approach to education that connects subject matter with real-world contexts and encourages students to make connections between their knowledge and its application in everyday life. Johnson (2018) defines CTL as 'an educational approach that helps students see meaning in academic material by linking academic subjects with the contexts of their daily lives.' According to Sanjaya (2016), there are seven main components in contextual learning, including Constructivism, Inquiry, Questioning, Learning Community, Modeling, Reflection, and Authentic Assessment. Nurhadi (2021) emphasizes that contextual learning 'allows for the occurrence of five important forms of learning, namely: (1) relating, (2) experiencing, (3) applying, (4) cooperating, and (5) transferring. These five forms of learning support the development of deep and meaningful understanding.

Writing Skills of Argumentative Texts

Argumentative text is a type of writing that aims to persuade readers by presenting reasons and evidence that support a particular opinion or viewpoint. According to Keraf (2017), "argumentation is a form of rhetoric that seeks to influence the attitudes and opinions of others, so that they believe and ultimately act according to what the writer desires."The structure of argumentative text generally consists of a thesis (statement of position), argumentation (reasons and supporting evidence), and conclusion (Toulmin, 2003). Toulmin also developed a more complex model of argumentation that consists of six elements: claim, data, warrant, backing, qualifier, and rebuttal. The skill of writing argumentative texts involves various cognitive aspects. Brown (2019) identifies several aspects of argumentative writing skills: (1) the ability to develop a clear and focused thesis; (2) the ability to construct logical arguments supported by evidence; (3) the ability to anticipate and respond to counterarguments; (4) the ability to organize ideas coherently; and (5) the ability to use appropriate and effective language. In elementary school students, argumentative writing skills are still in the development stage. According to Andrews et al. (2023), the development of argumentative ability in elementary school-aged children is influenced by their cognitive development. Children at this age begin to be able to consider multiple perspectives and develop simple arguments, although their ability to elaborate on arguments and anticipate counterarguments is still limited.

Integration of Cognitive Learning Theory in Contextual Learning for Writing

Argumentative Texts

The integration of cognitive learning theory in contextual learning for writing argumentative texts provides a strong theoretical foundation for developing effective learning practices. Several important aspects of this integration include:

(1). Knowledge Construction and Cognitive Schemas: The principle of constructivism in contextual learning is in line with Piaget's view of how children construct knowledge. Zhang and Wu (2022) explain that learning to write arguments can be viewed as a process of constructing cognitive schemas about the structure of arguments and persuasive strategies. Through writing experiences in meaningful contexts, students develop and refine their cognitive schemas about argumentative texts.

(2). Scaffolding and the Zone of Proximal Development: The components of modeling and learning communities in contextual learning reflect the concepts of scaffolding and ZPD from Vygotsky. Graham and Harris (2018) emphasize the importance of 'scaffolded instruction' in writing learning, where teachers gradually decrease support as students' abilities increase. Through collaboration with peers and teacher guidance, students can achieve higher levels of argumentative writing skills than they could achieve on their own.

(3). Logical Reasoning and Cognitive Development: Writing argumentative texts requires logical reasoning skills, which develop alongside a child's cognitive development. Kuhn (2020) explains that the ability to argue involves metacognitive and epistemological skills, such as the ability to evaluate evidence and consider alternative perspectives. Contextual learning based on real-world situations provides opportunities for students to develop reasoning skills in meaningful contexts.

(4). Language as a Mediating Tool: Vygotsky's view of language as a cognitive mediating tool is relevant in the learning of argumentative writing. Newell et al. (2019) revealed that through the writing process, students not only express their ideas but also organize and clarify their thoughts. In contextual learning, students are encouraged to use language to explore and discuss real-world issues, which helps them develop their reasoning and argumentative skills.

4. Conclusion

This qualitative study examined the effectiveness of contextual learning methods grounded in cognitive learning theory for developing argumentative writing skills among 27 sixth-grade students at SDN 093 Tunas Harapan Cijerah, Bandung. The findings directly address the research questions by demonstrating that contextual learning approaches aligned with Piaget's constructivism and Vygotsky's zone of proximal development principles effectively enhance students' argumentative writing competencies.

The primary contribution of this research lies in establishing the pedagogical efficacy of integrating contextual learning with cognitive learning theory in elementary writing instruction. Students showed measurable improvements in five key areas: constucting clear and topic-relevant thesis statements, developing logical arguments with concrete evidence, employing persuasive language effectively, organizing coherent text structures, and applying systematic reasoning. Beyond technical writing skills, the approach successfully fostered increased student motivation, active engagement, and metacognitive awareness during the writing process.

The practical implications of these findings indicate that contextual learning methods create meaningful learning environments appropriate for elementary students' cognitive developmental stages. By connecting abstract argumentative concepts to students' everyday experiences through scaffolded instruction, teachers can facilitate deeper understanding and more authentic skill development in academic writing.

4.1 Limitations

This study acknowledges several limitations that should be considered when interpreting the findings. First, as a single case study conducted at one elementary school in Bandung, the results may have limited generalizability to other educational contexts with different student populations, resources, or cultural settings. Second, the absence of a control group prevents direct causal attribution of improvements solely to the contextual learning intervention, as maturation or other external factors may have contributed to observed changes. Third, the relatively small sample size (N=27) and short duration

of the study restrict the ability to assess long-term retention and transfer of argumentative writing skills. Fourth, variations in students initial writing abilities and cognitive development levels presented challenges in providing uniformly effective instruction across all participants. Finally, the reliance on qualitative data collection methods, while providing rich descriptive insights, may introduces researcher bias in interpretation and limit the statistical validation of effectiveness claims.

4.2 Recommendations

4.2.1 For Educational Practitioners

For teachers, the implementation of argumentative learning can be executed by systematically connecting writing topics to students' lived experiences and community issues. Scaffolding techniques need to be applied progressively, commencing with highly structured modeling and gradually releasing responsibility as students' competences develops. Collaborative learning activities should be designed to leverage peer interaction in facilitating knowledge construction within students' zones of proximal development. Continuous formative assessment must be conducted to monitor individual progress and adjust instructional support accordingly, while adequate time allocation should be provided for inquiry-based exploration and reflective activities that deepen cognitive processing.

For school administrators, support for teachers' professional development is essential, particularly that which focuses on contextual learning pedagogy and the application of cognitive learning theory. The establishment of collaborative teacher learning communities enables the sharing of best practices in implementing constructivist writing instruction. The availability of diverse, authentic learning resources that represent students' cultural contexts and lived experiences must be ensured. Flexible scheduling should be created to accommodate the extended time requirements of contextual learning activities, and differentiated instruction approaches that address varying student ability levels and learning needs require full support.

For education department officials, contextual learning principles need to be integrated into curriculum guidelines and teacher training programs for elementary-level writing instruction. Standardized assessment frameworks should be developed to evaluate both process and product dimensions in argumentative writing development. Resource allocation is necessary to enable schools to access authentic learning materials and contexts relevant to local communities. Networks for knowledge exchange among educators implementing cognitive learning theory-based approaches need to be facilitated, and policy adaptations that allow flexibility in instructional time and methods to accommodate constructivist pedagogies should be seriously considered.

4.2.2 For Future Research

To build upon these findings and address the identified limitations, several directions for future research are recommended: 1) Quasi-Experimental Studies: Conduct controlled comparison studies with pre-test/post-test designs comparing contextual learning methods against traditional writing instruction approaches, utilizing both treatment and control groups to establish clearer causal relationships between the intervention and writing outcomes, 2) Comparative Studies Across Context: Replicate this research across multiple schools with diverse demographic characteristics (urban/rural, different socioeconomic backgrounds, varying school resources) to assess the transferability and adaptability of contextual learning methods in different educational settings, 3) Longitudinal Studies: Implement extended-duration studies tracking students' argumentative writing development over multiple grade levels (e.g., grades 4-6 0r 6-8) to evaluate long-term skill retention, transfer to other academic domains, and developmental trajectories under sustained contextual learning approaches, 4) Mixed-Methods Research: Combine quantitative measures (standardized writing assessment, pre-post skill measurements) with qualitative data (classroom observations, student interviews) to provide more comprehensive understanding of both effectiveness and underlying cognitive processes, 5) Comparative Pedagogical Approaches: Investigate the relative effectiveness of different instructional frameworks within contextual learning (e.g., problem-based learning vs. project-based learning vs. inquiry-based learning) for developing specific components of argumentative writing competence, 6) Technology Integration Studies: Explore how digital tools and online collaborative platforms can enhance contextual learning experiences and support cognitive processes in argumentative writing instruction for

elementary students, 7) Teacher Implementation Studies: Examine factors influencing teachers' successful adoption and sustained implementation of contextual learning methods, including professional development models, institutional support structure, and teacher beliefs about writing instruction.

4.2.3 Transferability Considerations

While this study's findings demonstrate effectiveness within the specific context of SDN 093 Tunas Harapan Cijerah, Bandung, the transferability of these results to other educational settings depends on several contextual factors. Educators and researchers considering adaption of these methods should account for: local curriculum requirements and assessment frameworks: available instructional resources and learning materials; teacher preparation and pedagogical content knowledge; student population characteristics including language backgrounds and prior writing experiences; school culture and support for constructivist approaches; and community contexts that provide authentic topic for argumentative writing. Successful transfer requires thoughtful adaptation rather than direct replication, with careful attentionto maintaining the core principles of contextual learning and cognitive learning theory while adjusting implementation details to fit local contexts and constraints.

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