

THE EFFECT OF HOTS INSTRUCTION ON THE CRITICAL THINKING SKILLS OF FIFTH-GRADE STUDENTS AT NURUL QOMAR ELEMENTARY SCHOOL IN THE CIVIC EDUCATION COURSE

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ABSTRACT

This study aims to determine the effect of Higher Order Thinking Skills (HOTS)-based learning on the critical thinking ability of fifth-grade students in Civic Education (PPKn) at SD Nurul Qomar. The study employed a quantitative approach using a quasi-experimental design with a one group pretest-posttest model. The participants consisted of 25 students selected through a saturated sampling technique. Data were collected through tests, observations, and documentation, and analyzed using descriptive statistics, the Shapiro-Wilk normality test, and the Paired Sample T-Test with SPSS. The results showed an increase in the average score from 65.40 in the pretest to 78.76 in the posttest. The normality test indicated that the data were normally distributed. The hypothesis test showed a significance value of less than 0.05, indicating a difference between scores before and after treatment. HOTS-based learning encouraged students to be more active in analyzing problems, expressing ideas, and drawing logical conclusions.

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INTRODUCTION

Learning is a process that results in changes in students' knowledge, attitudes, and skills through interactions with their environment (N. F. Putri & Azzizah, 2025; Anada & Rohman, 2023). In the context of 21st-century education, this process is not only oriented toward mastering content but also toward developing higher-order thinking skills, particularly critical thinking (Prasasti & Anas, 2023). Critical thinking enables students to analyze information, evaluate arguments, and make reasoned decisions, which are essential competencies in facing increasingly complex social challenges (Yusnaldi et al., 2023; Lubis, 2022).

At the elementary school level, the development of critical thinking skills is crucial, as this stage forms the foundation of students' cognitive and character development (Puslitjak, 2020). However, empirical conditions in classrooms indicate that learning practices have not fully supported this goal. In Pancasila and Civic Education (PPKn), especially at the fifth-grade level, instruction is still predominantly teacher-centered (Putri & Azzizah, 2025;

Hasibuan, 2024). Students tend to receive information passively, with limited opportunities to engage in analytical discussions, problem-solving, or decision-making activities. As a result, students' critical thinking skills remain underdeveloped, particularly in understanding real-life civic issues such as cooperation, deliberation, and citizens' rights and responsibilities (Safran et al., 2024; Adristi et al., 2024).

To address this issue, learning approaches that actively engage students in higher-order cognitive processes are needed. One such approach is Higher-Order Thinking Skills (HOTS)-based instruction, which emphasizes students' abilities to analyze (C4), evaluate (C5), and create (C6), as outlined in the revised Bloom's Taxonomy (Dwizar & Nasution, 2023). HOTS-based learning encourages students to connect knowledge with real-life contexts, thereby fostering meaningful and critical learning experiences (Yusuf, 2024; Dilah, 2023). Furthermore, contextual and meaningful learning environments have been shown to support the development of higher-order thinking skills (Hayani et al., 2020).

Previous studies have consistently shown that HOTS-based learning can improve students' critical thinking skills. For instance, Rohmawati and Fathoni (2022) found that students become more capable of analyzing problems and determining appropriate solutions when engaged in HOTS-oriented tasks. Similarly, Putri and Azzizah (2025) reported that learning strategies that promote higher-order thinking activities significantly enhance students' critical and creative thinking skills. Other studies also confirm that HOTS-based learning has a positive impact on students' learning outcomes and cognitive development (Watik et al., 2023).

However, most existing research has focused on general subjects or public school contexts. Studies specifically examining the implementation of HOTS in PPKn learning at the elementary level, particularly within private schools that integrate religious values, remain limited. This gap indicates the need for more contextualized research to understand how HOTS-based instruction operates in specific educational settings.

SD Nurul Qomar, as a private elementary school with distinct educational characteristics, provides a relevant context for examining this issue. Preliminary observations indicate that PPKn learning in this school still tends to rely on conventional methods, which may not optimally facilitate students' critical thinking development. Therefore, investigating the effect of HOTS-based instruction in this setting is important to provide empirical evidence and practical insights for improving PPKn learning.

Based on the above background, the research problem of this study is formulated as follows: *Is there a significant effect of Higher-Order Thinking Skills (HOTS)-based instruction on the critical thinking skills of fifth-grade students in PPKn learning at SD Nurul Qomar?*

Accordingly, the hypothesis of this study is that *HOTS-based instruction has a significant positive effect on the critical thinking skills of fifth-grade students in PPKn learning at SD Nurul Qomar.*

METHOD

This study employs a quantitative approach using a quasi-experimental design in the form of a one-group pretest–posttest design. Charismana et al. (2022) explain that the quantitative approach is considered capable of identifying cause-and-effect relationships between variables through numerical data analyzed statistically. The quantitative approach was chosen because it allows for measuring changes in students' abilities before and after the intervention (Nasution, 2020). This research design involves a single group without a comparison group.

However, it should be noted that the use of a one-group pretest–posttest design has limitations in terms of internal validity, particularly the absence of a control group, which may allow external factors to influence the observed changes. Therefore, the findings of this study are interpreted within this limitation.

This design was chosen due to field conditions that did not support dividing the class into experimental and control groups, as the number of fifth-grade students was limited and consisted of only one class. Additionally, this design was selected to directly observe changes in students' critical thinking skills before and after the implementation of HOTS-based learning. The research subjects were given a pretest to assess their critical thinking skills before the implementation of HOTS-based learning, followed by the intervention in the form of HOTS-based learning, and then a posttest to assess changes in critical thinking skills after the intervention.

The HOTS-based learning intervention was implemented over four meetings, each lasting approximately 2×35 minutes, in the Civic Education (PPKn) class.

The implementation of HOTS-based learning followed several stages: (1) presenting contextual civic problems related to students' daily lives, (2) guiding students to analyze the problems (C4), (3) encouraging students to evaluate alternative solutions through discussion (C5), and (4) asking students to formulate conclusions or solutions (C6). These activities were carried out through group discussions, question-and-answer sessions, and problem-solving tasks.

The study was conducted at Nurul Qomar Elementary School among fifth-grade students in the Civic Education class. The study population and sample consisted of all 25 fifth-grade students at Nurul Qomar Elementary School, selected using a saturated sampling technique due to the limited number of research subjects. Sahir (2021) explains that saturated sampling is used when the population is too small; therefore, all members of the population are included in the research sample. Wibowo (2024) also explains that the saturated sampling technique is used when the population size is less than 100; this technique is often the best choice to ensure that the research results are more representative of the population.

In addition to tests, the researcher also used a non-test data collection method, namely documentation. The use of these various data collection techniques aimed to strengthen the research data and provide a more comprehensive picture of the process and outcomes of implementing HOTS-based learning on students' critical thinking skills. Documentation was used to supplement data in the form of instructional materials and student learning outcomes.

The variables in this study are HOTS-based learning as the independent variable and students' critical thinking skills as the dependent variable. HOTS-based learning was implemented through learning activities that required students to analyze civic issues, evaluate various alternative solutions, and draw logical conclusions within the context of Civic Education (PPKn) instruction.

The instrument used to measure students' critical thinking skills was a written test in the form of essay questions, developed based on critical thinking indicators, including: (1) the ability to identify problems, (2) the ability to analyze information, (3) the ability to evaluate arguments or solutions, and (4) the ability to draw logical conclusions.

Each item was designed to reflect higher-order thinking levels (C4–C6) and was scored using a **rubric scale**, allowing for more objective assessment of students' responses.

The research data was analyzed using SPSS software. The analysis began with descriptive statistics to determine the general overview of the pretest and posttest results. Subsequently, validity and reliability tests were conducted to evaluate the instruments. After that, an assumption test was conducted using the Shapiro–Wilk test. Based on the normality test, the data showed a normal distribution, so the hypothesis test was conducted using a parametric test, namely the Paired Sample T-Test, to determine whether or not there was a significant difference between the students' pretest and posttest results.

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RESULTS AND DISCUSSION

RESULTS

The results of this study were obtained from pretests and posttests administered to 25 fifth-grade students at Nurul Qomar Elementary School. Data were analyzed using SPSS software to determine differences in student learning outcomes before and after the intervention, based on pretest and posttest scores. Prior to use, the research instruments were tested for validity and reliability. The validity test results showed that all test items had a calculated r value greater than the table r value (0.396), thus confirming their validity. The reliability test using Cronbach's Alpha yielded a value greater than 0.70, indicating that the instrument possesses a good level of reliability and is suitable for use in this study.

Table 1. Descriptive statistics of pre-test and post-test results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
PRETEST	25	43.0	83.0	65.400	9.2556
POSTEST	25	60.0	90.0	78.760	8.8047
Valid N (listwise)	25				

Table 1 summarizes the descriptive statistics of students' scores before and after the intervention.

The mean pretest score was 65.40 (SD = 9.26), while the mean posttest score increased to 78.76 (SD = 8.80). The minimum and maximum scores also improved from 43–83 in the pretest to 60–90 in the posttest.

These results indicate a consistent upward shift in student performance after the implementation of HOTS-based learning, both in terms of average achievement and score distribution.

Table 2. Results of the Normality Test (Shapiro-Wilk)

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PRETEST	.120	25	.200*	.974	25	.735

POSTEST	.160	25	.096	.909	25	.529
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*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The Shapiro–Wilk test was used to examine the normality of the data distribution.

The results showed that the significance values for the pretest ($p = 0.735$) and posttest ($p = 0.529$) were both greater than 0.05, indicating that the data were normally distributed. Therefore, parametric statistical analysis using a paired-sample t-test was appropriate.

Tabel 3. Hypothesis Testing (Paired-Sample T-Test)

		Paired Samples Test					
		Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	PRETEST - POSTEST	-13.3600	3.1739	.6348	-14.6701	-12.0499	
							t = -21.047, df = 24, Sig. (2-tailed) < .001

The paired-sample t-test results showed a statistically significant difference between pretest and posttest scores ($t(24) = -21.047$, $p < 0.001$). Thus, H_0 was rejected, indicating that the HOTS-based learning intervention had a significant effect on student learning outcomes.

To further examine the magnitude of this effect, Cohen's d was calculated using the mean difference and standard deviation of the differences. The result yielded an effect size of approximately $d \approx 4.21$, which can be categorized as a very large effect. This indicates that the intervention not only produced statistically significant results but also had a substantial practical impact on students' performance.

The findings indicate that students' critical thinking skills improved following the implementation of HOTS-based learning. Prior to the intervention, students demonstrated limited ability to analyze problems, justify their answers, and draw logical conclusions.

After the intervention, students showed noticeable progress in identifying problems, constructing arguments, and making reasoned conclusions. This improvement suggests that HOTS-based learning facilitates higher-order cognitive processes, such as analysis, evaluation, and reasoning, which are essential components of critical thinking in PPKn learning.

DISCUSSION

Based on the results of a study conducted on 25 fifth-grade students at Nurul Qomar Elementary School, it was found that there was a difference in student learning outcomes before and after the implementation of HOTS-based instruction. This was demonstrated by the results of a descriptive analysis, which showed a difference in the mean scores between the pretest and posttest.

The increase in scores not only indicates a difference in learning outcomes but also reflects a change in students' thinking processes. HOTS-based learning encourages students not only to receive information but also to process that information through analysis, evaluation, and drawing conclusions. This process helps students build a deeper understanding, thereby allowing their critical thinking skills to develop gradually throughout the learning process.

The results of the normality test using the Shapiro-Wilk test showed that the pretest and posttest data had significance values of 0.735 and 0.529, respectively, which were greater than 0.05. This means that the data are normally distributed and meet the requirements for parametric testing. Therefore, the subsequent analysis used the Paired Sample T-Test. Previous research indicates that the normality test is a crucial initial step before conducting parametric statistical analysis. The Shapiro-Wilk test is frequently chosen because it can accurately assess data

distribution, particularly with small sample sizes. The results of the study by Maria (2025) show that pretest and posttest data with significance values greater than 0.05 are considered normally distributed; thus, the analysis proceeds using the Paired Sample T-Test to determine the differences before and after the treatment. Similar findings were also reported by Hardjito (2025), who demonstrated an improvement in results following the treatment through the paired t-test. Another study in the Journal of Kusumaningtyas (2024) also stated that data meeting the normality assumption can be analyzed using the paired t-test to observe changes in values. Al Fatih et al. (2024) explain that the normality test is a primary requirement for the use of parametric tests. Based on these results, the significance values for the pretest and posttest, which are greater than 0.05, indicate that the data are normally distributed and suitable for analysis using a paired-sample t-test.

It was found that there was a significant difference between pretest and posttest scores following the implementation of HOTS-based instruction. This was demonstrated by the results of the Paired Sample T-Test, which showed a two-tailed significance level (Sig.) of <0.05 . Consequently, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted. This significant difference indicates that the improvement in students' critical thinking skills is the result of the implementation of purposefully designed instruction. In HOTS-based learning, students are engaged in learning that requires them to analyze problems, express opinions, and evaluate. These activities provide a more meaningful learning experience compared to learning that focuses solely on content. It can be concluded that HOTS-based learning has an impact on students' critical thinking skills. Ismail (2024) study demonstrated a significant improvement in critical thinking skills following the implementation of HOTS-based learning. Similar results were also found in the study by Syaidi & Murti (2024), which used a Paired Sample T-Test and obtained a significance level of less than 0.05, indicating a difference between pretest and posttest scores (Ritonga et al., 2022). Other studies have also reported that data that have passed the normality test using the Shapiro-Wilk test can be analyzed using a paired t-test and show a significant improvement after the intervention is administered. These results indicate that HOTS-based learning has a positive impact on the improvement of students' critical thinking skills (Lubis, 2025).

The improvement in students' critical thinking skills in this study indicates that students' active engagement in the learning process plays a crucial role in enhancing learning outcomes. Students do not merely passively receive information but are actively involved in problem analysis, discussions, and drawing conclusions. This aligns with previous research stating that active learning based on HOTS can improve the critical thinking skills of elementary school students (Gufran & Ruslan, 2025; Lubis et al., 2026). Another study by Wulandari et al. (2023) showed that students who were actively involved in learning demonstrated improved abilities in evaluating and drawing logical conclusions.

These research findings indicate that learning that emphasizes student activity and the use of a HOTS-based approach can improve critical thinking skills through direct involvement in the learning process.

In practice, HOTS-based learning requires readiness from both teachers and students. Teachers are expected to be able to design creative and challenging lessons, while students need to be accustomed to thinking actively and independently. If not implemented optimally, the results obtained will not be optimal. Student engagement in the learning process is also a key factor in determining the success of learning. This is supported by research by Munawir et al. (2025), which found that, in practice, students began to exhibit changes in learning behavior, such as being more confident in expressing their opinions, actively asking questions, and being able to provide reasons for the answers they gave. Activities such as group discussions, problem-solving, and question-and-answer sessions serve as means for students to practice thinking more deeply (Lubis & Ritonga, 2023). This indicates that HOTS-based learning impacts not only learning outcomes but also the learning process and students' attitudes. Findings from another study by W. N. Putri et al. (2026) also show that learning that actively involves students can improve learning outcomes and higher-order thinking skills. These results demonstrate that the success of HOTS-based learning is influenced by teachers' readiness as well as students' active engagement in the process.

This study has several limitations that should be noted. The research design did not include a control group, so the comparison of results was limited to the same group before and after the intervention. Additionally, the sample

size was limited to a single class of 25 students, making the findings of this study difficult to generalize widely. Therefore, future research is expected to employ a more comprehensive experimental design that includes a comparison group and a larger sample size. Overall, the results of this study indicate that HOTS-based learning has a positive impact on enhancing the critical thinking skills of fifth-grade students in Civic Education. This improvement demonstrates that the use of appropriate learning strategies can help students develop the higher-order thinking skills that are essential for 21st-century learning.

CONCLUSION

Based on the research findings, Higher Order Thinking Skills (HOTS)-based learning has been shown to have a positive effect on the critical thinking skills of fifth-grade students in Civic Education (PPKn) at Nurul Qomar Elementary School.

The findings indicate that students demonstrated improved abilities in analyzing problems, providing logical reasoning, and drawing conclusions more systematically after participating in HOTS-based learning activities.

HOTS-based learning encourages active student engagement through analytical thinking, discussion, and reflective reasoning, which are essential components in developing critical thinking skills in PPKn learning.

Therefore, teachers are encouraged to integrate HOTS-oriented strategies, such as problem-based tasks and guided discussions, into PPKn instruction to foster students' higher-order thinking and improve learning quality.

However, this study is limited by its small sample size and focus on a single school context, so the generalizability of the findings may be limited. Future research is recommended to involve larger and more diverse samples to strengthen the evidence.

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