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IMPROVING STUDENTS' CRITICAL THINKING ABILITIES THROUGH A CONTEXTUAL APPROACH IN MATHEMATICS LEARNING IN GRADE SUKAMAKMUR STATE 1 HIGH SCHOOL

PENINGKATAN KEMAMPUAN BERPIKIR KRITIS SISWA MELALUI PENDEKATAN KONTEKSTUAL DALAM PEMBELAJARAN MATEMATIKA DI KELAS X SMA NEGERI 1 SUKAMAKMUR

Fitri Melia Sari[1*], Ade Irfan[2], Anzora[3]

[1*]Universitas Abulyatama, Email: fitrimeliasari451@gmail.com
[2]Universitas Abulyatama, Email: adeirfan_matematika@abulyatama.ac.id
[3]Universitas Abulyatama, Email: anzora_matematika@abulyatama.ac.id

*email koresponden: fitrimeliasari451@gmail.com

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Abstract

This study aims to improve students' critical thinking skills through a contextual approach in mathematics learning on the topic of sequences and series in Grade X at SMA Negeri 1 Sukamakmur. This study employed Classroom Action Research (CAR), which was conducted in three cycles. Each cycle consisted of planning, action implementation, observation, and reflection stages. The subjects of the study were 28 students of Grade X-1 at SMA Negeri 1 Sukamakmur. Data were collected using critical thinking skills tests, observation sheets, and documentation. In Cycle I, learning began by relating the concepts of sequences and series to everyday life situations. The reflection results showed that some students still had difficulties understanding contextual problems and providing reasons. In Cycle II, the learning process was improved by providing simpler examples, guidance in analyzing problems, and opportunities for students to discuss and compare problem-solving strategies. In Cycle III, students were given more challenging contextual problems, opportunities to present their work, conduct reflection, and reinforce their understanding of the concepts. The results showed an improvement in students' critical thinking skills in each cycle. In Cycle I, 7 students (25%) achieved mastery, while in Cycle II, 17 students (60.71%) achieved mastery, and in Cycle III, 25 students (89.29%) achieved mastery. Therefore, the implementation of a contextual approach can improve students' critical thinking skills in mathematics learning on the topic of sequences and series.

Keywords : Critical Thinking Skills, Contextual Approach, Mathematics Learning, Sequences and Series, Classroom Action Research.

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Abstrak

Penelitian ini bertujuan untuk meningkatkan kemampuan berpikir kritis siswa melalui pendekatan kontekstual dalam pembelajaran matematika pada materi barisan dan deret di kelas X SMA Negeri 1 Sukamakmur. Jenis penelitian ini adalah Penelitian Tindakan Kelas (PTK) yang dilaksanakan dalam tiga siklus. Setiap siklus terdiri atas tahap perencanaan, pelaksanaan tindakan, observasi, dan refleksi. Subjek penelitian adalah 28 siswa kelas X-1 SMA Negeri 1 Sukamakmur. Teknik pengumpulan data menggunakan tes kemampuan berpikir kritis, lembar observasi, dan dokumentasi. Pada siklus I, pembelajaran diawali dengan mengaitkan konsep barisan dan deret dengan situasi kehidupan sehari-hari. Hasil refleksi menunjukkan masih terdapat siswa yang kesulitan memahami masalah kontekstual dan mengemukakan alasan. Pada siklus II, pembelajaran diperbaiki dengan memberikan contoh yang lebih sederhana, bimbingan dalam menganalisis masalah, serta kesempatan berdiskusi dan membandingkan strategi penyelesaian. Pada siklus III, siswa diberikan masalah kontekstual yang lebih menantang, kesempatan mempresentasikan hasil, melakukan refleksi, dan memperkuat konsep. Hasil penelitian menunjukkan peningkatan kemampuan berpikir kritis pada setiap siklus. Pada siklus I, sebanyak 7 siswa (25%) mencapai ketuntasan, siklus II sebanyak 17 siswa (60,71%), dan siklus III sebanyak 25 siswa (89,29%). Dengan demikian, penerapan pendekatan kontekstual dapat meningkatkan kemampuan berpikir kritis siswa dalam pembelajaran matematika pada materi barisan dan deret.

Kata Kunci : Kemampuan Berpikir Kritis, Pendekatan Kontekstual, Pembelajaran Matematika, Barisan dan Deret, Penelitian Tindakan Kelas.

1. INTRODUCTION

Critical thinking is a crucial skill in mathematics learning because it helps students analyze problems, use logical reasoning, determine solution strategies, and draw accurate conclusions. This ability is needed not only to solve mathematical problems but also to address various challenges in the school environment and everyday life. Therefore, mathematics learning should provide students with opportunities to develop critical thinking skills through problem-solving and problem-solving based on Higher Order Thinking Skills (HOTS) (Marzuki et al., 2021; Pebrianti et al., 2022; Arafah et al., 2021; Khotimah & Sari, 2020).

Students' low critical thinking skills may be related to the teacher-centered learning process, which tends to rely on explanations and memorizing formulas rather than analyzing problems independently. This condition results in students lacking the skills to understand problems, reason, determine solution strategies, and draw conclusions. Therefore, a learning approach is needed that actively engages students and connects the material to real-life experiences to make learning more meaningful (Christofel & IAKAN, 2023; Tarigan et al., 2021).

One approach that can be used is Contextual Teaching and Learning (CTL), a learning approach that connects subject matter to everyday life situations. Through this approach, students are encouraged to build understanding based on experience, analyze contextual problems, discuss, and apply learned concepts to find solutions. The CTL approach provides students with opportunities to develop reasoning and understand the benefits of mathematical concepts more concretely (Ismatunsarrah, 2020; Sari & Putra, 2022; Rahmawati & Nurhadi, 2021).

Critical thinking skills in this study refer to the indicators proposed by Ennis, including providing simple explanations, building basic skills, drawing conclusions, providing further explanations, and developing strategies and tactics for solving problems (Miatun & Khusna, 2020). These indicators are used to assess students' ability to understand information, analyze problems, provide reasons, and determine logical solutions.

Based on initial observations in class X-1 of SMA Negeri 1 Sukamakmur, students' critical thinking skills are still relatively low. Initial test results showed that only 7 of 28 students (25%)

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achieved completion, while 21 students (75%) were incomplete, with an average score of 61.86. Students still experienced difficulties when solving problems that differed from the examples given, especially those requiring them to connect mathematical concepts to everyday life. These problems indicate the need for improved learning through approaches that encourage students to think actively, critically, and systematically.

The topic of sequences and series was chosen because it relates to various everyday life situations and provides students with opportunities to recognize patterns, analyze relationships between numbers, determine solution strategies, and explain the reasons for their answers. Based on these conditions, this study aims to determine the application of the CTL approach and the improvement of students' critical thinking skills through this approach in mathematics learning on sequences and series in class X of SMA Negeri 1 Sukamakmur.

2. RESEARCH METHOD

This study used the Classroom Action Research (CAR) method, which aimed to improve students' critical thinking skills through the application of the Contextual Teaching and Learning (CTL) approach to mathematics learning. The research implementation adhered to an action model consisting of four stages: planning, implementation, observation, and reflection. These four stages were implemented repeatedly in three cycles, with learning improvements in each cycle based on the results of previous observations and reflections (Kemmis, 1988, as cited in Sanjaya, 2009).

The study was conducted at SMA Negeri 1 Sukamakmur, Aceh Besar Regency, Aceh Province, from July 20 to August 4, 2026, during the 2026/2027 academic year. The subjects were 28 10th-grade students. The learning focused on sequences and series, applying the CTL approach through contextual problem presentation, Student Worksheets (LKS), discussions, opinion expression, presentation of solutions, and learning reflection.

Data collection used critical thinking ability tests, teacher and student activity observation sheets, and documentation. Tests were used to assess the development of students' critical thinking skills in each cycle, while observations were used to observe the implementation of learning, student engagement, and their involvement in the problem-solving process. Critical thinking skills assessment refers to the Ennis indicators, which include providing simple explanations, building basic skills, summarizing, providing further explanations, and developing strategies and tactics.

Test data were analyzed descriptively by calculating the average score and percentage of student completion in each cycle. The results of observations and reflections were used to evaluate the implementation of learning and determine improvements for the next cycle. The research success indicator was determined when at least 80% of students obtained a score of at least 75 and were in the good category in critical thinking skills, accompanied by increased learning activity.

3. RESULTS AND DISCUSSION

The results of a classroom action research study on 10th-grade students at SMA Negeri 1 Sukamakmur indicate that the application of the Contextual Teaching and Learning (CTL) approach can improve students' critical thinking skills in mathematics learning on sequences and series. This improvement is evident in the average grades, percentage of students completing the learning process, and student activity during the three research cycles.

In Cycle I, learning was conducted by connecting sequences and series to everyday life situations through contextual problems, discussions, and student worksheets (LKS). However, some students remained passive, lacked confidence in expressing their opinions, and had difficulty understanding the problems and determining appropriate solutions. Test results showed an average critical thinking score of 66.25, with 7 out of 28 students (25%) achieving completion. These results indicate that students' critical thinking skills have not yet reached the established success indicators, requiring improvements in learning in the next cycle.

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In Cycle II, improvements were made by presenting simpler and more gradual problems, providing guidance in analyzing problems, and increasing opportunities for students to discuss and compare solution strategies. These efforts encouraged students to be more active in working on worksheets, understanding contextual problems, and expressing their opinions. The average critical thinking skill score increased to 81.96, while the number of students achieving completion increased to 17 (60.71%). Despite this improvement, the completion percentage did not meet the minimum success indicator of 80%. Several students still needed guidance in determining problem-solving strategies, providing reasons, and communicating their thoughts independently.

In Cycle III, learning was improved by providing more varied and challenging contextual problems, strengthening guidance in problem analysis, and providing opportunities for students to present their work, reflect, and strengthen conceptual understanding. These improvements encouraged increased student engagement, independence, and confidence in participating in the learning process. Students also showed progress in understanding problems, determining solution strategies, providing reasons, and drawing logical conclusions. Test results showed an average score increase to 95, with 25 students (89.29%) achieving completion. This percentage exceeds the research success indicator, which requires at least 80% of students to achieve a score of at least 75 and be in the good category for critical thinking skills.

Overall, the research results show a consistent increase in critical thinking skills across three cycles. The average student score increased from 66.25 in Cycle I to 81.96 in Cycle II and 95 in Cycle III. The completion rate also increased from 25% to 60.71% and finally to 89.29%. This improvement was accompanied by changes in learning behavior, with students becoming more active in discussions, confident in expressing opinions, able to compare solution strategies, and more independent in solving math problems.

These findings indicate that the CTL approach provides students with opportunities to build understanding through the connection between mathematical concepts and real-world situations. The activities of analyzing contextual problems, discussing, providing reasons, and evaluating solutions help students develop more systematic reasoning. This aligns with Ismatunsarrah's (2020) view that the contextual approach connects learning material to real-world situations so that students can understand and apply concepts meaningfully. Sari and Putra (2022) and Rahmawati and Nurhadi (2021) also explained that contextual learning encourages students to identify important information, connect relevant concepts, determine strategies, and draw conclusions in solving problems.

The results of this study also align with Kusumaningsih's (2011) research, which demonstrated an increase in students' critical thinking skills through the CTL approach on trigonometric comparisons, with scores increasing from 56% in cycle I to 85% in cycle II. Furthermore, Ratnaningsih and Triwahyuni (2025) reported that the CTL approach positively impacted high school students' critical thinking skills and mathematics learning outcomes. Therefore, the results of the study at SMA Negeri 1 Sukamakmur reinforce the finding that implementing CTL can be an alternative learning method for improving mathematical critical thinking skills through contextual, active, and reflective learning experiences.

4. CONCLUSION

Based on the research results and discussions conducted in the previous chapter, it can be concluded that the application of the Contextual Teaching and Learning (CTL) approach can improve the critical thinking skills of 10th-grade students at SMA Negeri 1 Sukamakmur.

1. Application of the Contextual Teaching and Learning (CTL) Approach

The application of the Contextual Teaching and Learning (CTL) approach in mathematics learning in 10th-grade students at SMA Negeri 1 Sukamakmur was implemented through three cycles, including planning, implementation, observation, and reflection. Learning was conducted by linking learning to situations close to students' lives, providing contextual problems, guiding students in discussions, working on worksheets, expressing opinions, presenting their work, and reflecting and

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concluding the learning. Based on observations, the application of CTL improved with each cycle. Students who were initially passive and lacking in confidence gradually became more active, independent, and confident in expressing their opinions.

2. Improving Students' Critical Thinking Skills

The application of the CTL approach can improve the critical thinking skills of 10th-grade students at SMA Negeri 1 Sukamakmur. This is evident in the increase in average scores and completion percentages in each cycle. In Cycle I, the average student score was 66.25 with a 25% completion rate. In Cycle II, the average score increased to 81.96 with a 60.71% completion rate. Furthermore, in Cycle III, the average score reached 95 with a completion rate of 89.29%. In addition to improving test results, students' abilities to understand problems, determine strategies, provide reasons, express opinions, and draw conclusions also improved. Thus, the application of the CTL approach has been proven to improve students' critical thinking skills.

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