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Examining Students' Academic Performance Through Critical Thinking Skills Based on Their Mathematical Proficiency [Type your title here]

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ABSTRACT
Write your abstract in English here. The abstract contains all the core problems, how to solve them, and the results obtained. Abstract written left and right single-spaced. Note that Indonesian and English abstracts must be contained on only the first page of this article. Times New Roman font size 9. Maximum 250 words.
Keywords: Keywords 1, Keywords 2, Keywords 3.

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1. INTRODUCTION

Education in the twenty-first century emphasizes not only the acquisition of knowledge but also the development of higher-order thinking skills. Among these skills, critical thinking has become one of the most essential competencies that students must master to succeed academically and socially. Critical thinking enables learners to analyze information, evaluate arguments, make reasoned judgments, and solve problems effectively. Mathematics plays a significant role in developing students' logical reasoning and analytical abilities. The nature of mathematics requires students to interpret problems, formulate strategies, and justify solutions systematically. Therefore, mathematical learning is closely related to the cultivation of critical thinking skills.

Students' academic performance is often influenced by their level of mathematical proficiency. Learners with strong mathematical foundations tend to demonstrate better problem-solving abilities, structured reasoning, and deeper conceptual understanding. These attributes are strongly associated with critical thinking processes. Critical thinking in mathematics involves several cognitive components, including interpretation, analysis, evaluation, inference, explanation, and self-regulation. When students engage in mathematical tasks, they are required to activate these cognitive processes simultaneously. Thus, mathematical proficiency may serve as a predictor of students' critical thinking performance.

Critical thinking in mathematics includes cognitive processes such as analysis, evaluation, inference, and explanation—skills that are cultivated through problem-solving and reflective thinking activities (Rahmasari et al., 2023). Variations in students' mathematical ability are influenced by prior knowledge, instructional quality,

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and learning strategies, leading to differences in students' critical thinking performance (Yulianto, 2024).

Research has shown that learners with stronger mathematical foundations exhibit more sophisticated critical thinking skills compared to those with lower proficiency (Astuti, 2024). Academic performance is not merely a result of memorization but reflects deeper cognitive engagement and the ability to apply mathematical concepts to complex problems (Tambunan & Mahmudi, 2024).

In mathematics education, students' ability to justify their solutions logically is considered a key indicator of deep understanding and cognitive development (Siswanto & Setiawan, 2025). However, instructional practices in many classrooms remain focused on procedural learning rather than promoting inquiry and reasoning, which may limit students' critical thinking development (Rahmasari et al., 2023). Understanding how mathematical proficiency influences critical thinking can help educators design targeted strategies that foster meaningful learning and improve academic outcomes (Duru & Obasi, 2023).

Analyzing students' academic performance based on mathematical proficiency levels can also assist in identifying learners who require additional instructional support (Yulianto, 2024). The current study therefore aims to examine how students' mathematical ability relates to their critical thinking skills and overall academic performance in mathematics (Astuti, 2024). The findings are expected to provide insights for educators and curriculum developers to support instructional practices that integrate higher-order thinking skills with mathematical learning (Ziliwu, 2025).

2. RESEARCH METHOD

The Methods section describes the type of research conducted, including the time and location of the study, as well as the research objectives or targets. It also outlines the research subjects or participants involved in the study. In addition, this section explains the research procedures, instruments used for data collection, and the techniques employed to gather the data. All methodological components should be clearly presented to ensure transparency and reproducibility of the study.

Furthermore, the Methods section includes a detailed explanation of the data analysis techniques applied in the research, along with other relevant methodological aspects. The description of the target or objective, research subjects, procedures, data and instruments, as well as data collection and analysis techniques, may be presented in a continuous narrative without the use of subheadings. The content of this section should be adjusted according to the type and design of the research to accurately reflect the methodological approach used.

3. RESULTS AND DISCUSSION

3.1 *RESULTS*

The results and discussion section presents the results obtained and how they were achieved. The description should be comprehensive yet concise and coherent. The discussion of research results includes strengths and weaknesses, as well as testing.

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3.1.1 First-Level Subheading

For tabular data, presentation should use a table format, such as Table 1. The table should be titled in 10-point font. The title should be placed above the table. The table should be centered and referenced throughout the manuscript. If there is more than one table, number the tables, for example, Table 1, Table 2, and so on. Please avoid using vertical lines in tables.

Table 1. Percentage of Research Samples

School Type	Male (%)	Female (%)
MTs	45	55
SMP	40	60

When presenting a table, ensure it doesn't overlap the page. If a single column doesn't fit, combine two columns into a single column (specifically for the column presentation). If you want to display images, format them according to the following format.

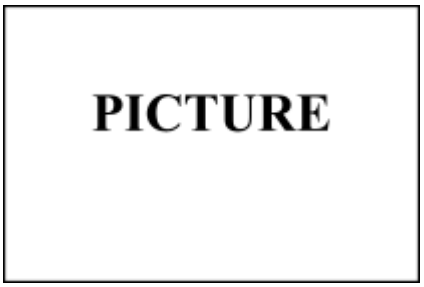

Figure 1. Percentage of Research Samples

The discussion focuses on linking the data and analysis results to the research problem or objectives and the broader theoretical context. The discussion is written in conjunction with the data being discussed. It is important to ensure that the discussion is not separated from the data being discussed.

3.1.2 Second-Level Subheading

Images are preferably provided in JPEG (JPG) or GIF file formats and may be submitted as separate files to facilitate image editing.

In referencing sources written by a single author, the author's last name should be followed by the year of publication. For example: Rahman (2015) states that .... For sources written by two authors, both authors' last names should be included, such as Wahidin and Purwanto (2016) explain that .... Alternatively, citations may be written in parentheses, for example: "An integrated student service information system has been proven to reduce total student service time by 30% to 50% (Arina, 2010; Fahmi, 2009; Kusdinar et al., 2010; Sumargiyani & Widayati, 2011)."

3.2 DISCUSSION

The Discussion section contains the interpretation and analysis of the research findings. In this part, the authors address questions such as: "What do these results mean?", "Why did these results occur?", and "How are they related to existing theories or previous studies?". The authors also compare their findings with prior research, identifying whether the results are consistent or contradictory, and provide scientific

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explanations for any differences. Therefore, the Discussion serves as a space to demonstrate a deep understanding of the data obtained.

In addition, the Discussion includes the implications and limitations of the study. This means that the authors explain the significance of the findings, for example in terms of educational practice, practical application, or theoretical development, and also acknowledge any limitations that may affect the results. Suggestions for future research are typically provided as well. Thus, the Discussion section functions to strengthen the contribution of the study and highlight its relevance within the academic field.

4. CONCLUSION AND SUGGESTIONS

Conclusions should be written in paragraph form, not as a list or numbered items. The conclusion summarizes the research findings and discussion. Conclusions should be presented in sentences that are easily understood by readers (in everyday language). Conclusions should avoid sentences containing statistical terminology and statistical figures. Unless the research findings are substantial, it is recommended not to use an enumeration format in the conclusion.

Suggestions can be input for future researchers or recommendations based on the research findings.

REFERENCES [Please Use APA Style (7th edition) for References]

A minimum of 20 recent references, published within the last decade, were utilized in this study to ensure the credibility, relevance, and alignment with current scholarly developments.

Duru, D. C., & Obasi, C. V. (2023). Critical thinking ability as a correlate of students' mathematics achievement: A focus on ability level. *Journal of Instructional Mathematics, 1(1),* 1–10. https://doi.org/10.37640/jim.v4i1.1753

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