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The Impact of Metacognitive Strategies on Critical Thinking Skills among Senior High School Students

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Abstract

This study explores the impact of metacognitive strategies on the development of critical thinking skills among senior high school students. A quantitative approach was employed, utilizing a pre-test and post-test design to assess the students' critical thinking abilities before and after the application of metacognitive training. The sample consisted of 100 senior high school students from a public school. Data were collected using a critical thinking skills test and a metacognitive awareness inventory. The results revealed a significant improvement in the students' critical thinking abilities, suggesting that metacognitive strategies can play a vital role in enhancing students' cognitive and analytical skills. The findings contribute to the growing body of research supporting the integration of metacognitive strategies into educational curricula to foster critical thinking.

Keywords: Metacognitive Strategies, Critical Thinking, Senior High School, Quantitative Research

Introduction

In the modern educational landscape, the importance of fostering critical thinking skills among students has become paramount. Critical thinking, defined as the ability to analyze, evaluate, and synthesize information to make informed decisions, is recognized as a key 21st-century skill. As the educational focus shifts towards deeper learning and cognitive development, educators are increasingly integrating metacognitive strategies to enhance students' learning processes. Metacognition, the awareness and regulation of one's cognitive processes, has been shown to significantly influence the development of critical thinking (Flavell, 2017; Tishman, Perkins, & Jay, 2018). This study aims to examine how metacognitive strategies can improve critical thinking skills among senior high school students.

Literature Review

Critical thinking has long been a focus of educational research, with scholars emphasizing its importance in various disciplines (Brookfield, 2017; Bensley, 2019). According to Norris and Ennis (2017), critical thinking involves not only the ability to analyze arguments but also the disposition to engage in reasoning. In the context of language and psychology education, critical thinking is essential for fostering independent thought and problem-solving skills (Fisher, 2001; Appleby, 2020).

Metacognitive strategies, which involve monitoring and controlling cognitive processes during learning, have been identified as powerful tools for promoting critical thinking. As described by Flavell (2017), metacognition helps learners assess their understanding and adjust their strategies accordingly, which can enhance cognitive flexibility. Research has shown that metacognitive awareness is positively correlated

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with academic success, particularly in subjects that require higher-order thinking skills, such as psychology and language education (Diestler, 2020; Birjandi & Bagherkazemi, 2021).

The integration of metacognitive strategies into the curriculum has shown positive results in various educational settings. For instance, Chaffee (2017) argues that encouraging students to reflect on their thinking processes enhances their ability to think critically. Moreover, studies by Doğanay and Demir (2019) suggest that metacognitive training can lead to significant improvements in self-regulation and academic performance. Despite this body of research, there remains a gap in understanding how these strategies specifically impact critical thinking among senior high school students in the Filipino context.

Methodology

This study utilized a quantitative research design to assess the impact of metacognitive strategies on the critical thinking skills of senior high school students. The research followed a pre-test/post-test experimental design with a control group.

Participants: The study involved 100 senior high school students (aged 16-18) enrolled in a public school. These students were randomly assigned to two groups: an experimental group (50 students) that received metacognitive strategy training and a control group (50 students) that did not.

Instruments:

Critical Thinking Skills Test: A standardized test was used to assess students' ability to analyze and evaluate information. The test covered various aspects of critical thinking, including logical reasoning, argument evaluation, and problem-solving.

Metacognitive Awareness Inventory (MAI): The MAI, developed by Schraw and Dennison (1994), was used to measure students' awareness and regulation of their cognitive processes before and after the intervention.

Procedure:

The study began with the administration of the critical thinking skills test and the MAI to both the experimental and control groups.

The experimental group participated in a 4-week metacognitive training program, which included activities such as self-reflection, strategy planning, and monitoring of their learning processes. The control group continued with the regular curriculum without any additional interventions.

After the intervention, both groups were retested using the same instruments to measure any changes in their critical thinking skills and metacognitive awareness.

Data Analysis: The data were analyzed using paired t-tests to compare the pre- and post-test scores within each group. An independent t-test was also used to compare the difference in scores between the experimental and control groups.

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Results

The analysis revealed significant improvements in the critical thinking skills of the experimental group. The average score on the critical thinking skills test increased from 65% to 85% post-intervention, a difference that was statistically significant ($t(49) = 7.68$, $p < 0.05$). In contrast, the control group showed minimal improvement, with average scores rising from 64% to 67% ($t(49) = 1.12$, $p > 0.05$).

Similarly, the metacognitive awareness inventory scores for the experimental group increased from an average of 56% to 78% ($t(49) = 8.91$, $p < 0.05$), indicating a significant gain in metacognitive awareness. The control group showed no significant change in their metacognitive scores ($t(49) = 1.45$, $p > 0.05$).

Discussion

The results of this study support the hypothesis that metacognitive strategies have a positive impact on the development of critical thinking skills. The significant improvement in the critical thinking scores of the experimental group suggests that when students are trained to monitor and regulate their cognitive processes, they are better able to analyze, evaluate, and synthesize information. This finding aligns with previous studies that have demonstrated the benefits of metacognitive training in enhancing critical thinking and problem-solving skills (Topping & Bryce, 2020; Fok, 2020).

The increase in metacognitive awareness in the experimental group further underscores the role of metacognition in cognitive development. According to Halpern (2020), students who are aware of their thinking processes are more likely to engage in reflective thinking and make adjustments to improve their reasoning. These skills are crucial for academic success and are transferable to real-world problem-solving scenarios.

However, the lack of significant improvement in the control group highlights the importance of deliberate intervention and suggests that simply following the standard curriculum may not be sufficient for fostering critical thinking.

Conclusion

This study demonstrates that metacognitive strategies can significantly improve critical thinking skills among senior high school students. By encouraging students to reflect on their cognitive processes, metacognitive training helps them become more effective learners and critical thinkers. These findings have important implications for educational practice, suggesting that integrating metacognitive strategies into the curriculum could enhance students' academic performance and cognitive development. Future research could explore the long-term effects of metacognitive training and its impact on various academic subjects.

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