



The Effect of the Monoraga Game (Sports Monopoly) on Students' Critical Thinking Skills in Physical Fitness Material for Eighth-Grade Students at SMP Negeri 2 Alalak

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Abstract

This study aimed to examine changes in students' critical thinking skills following the implementation of the Monoraga (Monopoly of Sports) game in physical fitness learning among eighth-grade students at SMP Negeri 2 Alalak. The study employed a quantitative approach using a one-group pretest–posttest pre-experimental design. The sample consisted of 30 students from class VIII E selected through purposive sampling. Students' critical thinking skills were measured using a Multiple Choice Multiple Answer (MCMA) test based on six indicators: interpretation, analysis, inference, evaluation, explanation, and self-regulation. Data were analyzed using descriptive statistics, the Shapiro–Wilk normality test, and a paired sample t-test with the assistance of SPSS. The results showed an increase in the mean score from 77.4 on the pretest to 85.9 on the posttest. The paired sample t-test indicated a significance value below 0.05, suggesting a statistically significant difference between pretest and posttest scores. Improvements were observed across all critical thinking indicators, with the largest increases found in the analysis and evaluation indicators. These findings suggest that the implementation of the Monoraga game was associated with improved critical thinking scores in physical fitness learning. In conclusion, the Monoraga game may serve as an alternative learning medium in Physical Education, Sports, and Health (PJOK) to support students' engagement in discussion, problem-solving, and decision-making activities. However, because this study employed a one-group pretest–posttest design without a control group, further research using a more rigorous experimental design is needed to confirm the effectiveness of the Monoraga game.

Keywords: Monoraga; Critical Thinking; Physical Education; Physical Fitness; Game-Based Learning.

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INTRODUCTION

Physical Education, Sports, and Health (PJOK) is a subject that integrates physical activity, knowledge, and character development through various learning activities. In PJOK learning, students are also encouraged to develop thinking skills, including critical thinking abilities. These abilities can be observed when students are able to understand the purpose of an exercise, relate physical activities to body needs, determine appropriate forms of exercise, and evaluate the effects of exercise on health and physical fitness (Facione, 2015). In physical fitness materials, students are not only expected to perform movements but also to understand the reasons for using such movements and their benefits in daily life. Therefore, PJOK learning requires learning activities and instructional media that can assist students in becoming more active in processing information throughout the learning process.

The implementation of PJOK learning in schools still faces several challenges. Based on the author's experience during the Kampus Merdeka Teaching Assistance Program conducted from August 19, 2025, to October 19, 2025, at SMP Negeri 2 Alalak, it was found that the school only had one PJOK teacher responsible for teaching 15 study groups, consisting of five Grade VII classes, five Grade VIII classes, and five Grade IX classes. According to the Regulation of the Minister of Education and Culture Number 15 of 2018, teachers are required to fulfill a minimum teaching workload of 24 face-to-face hours per week (Permendikbud 15, 2018). At the junior high school level, PJOK subjects generally have an allocation of three lesson hours per week for each study group, meaning that one PJOK teacher should ideally handle a maximum of eight study groups. The large number of classes

resulted in physical fitness practice sessions not being conducted optimally due to limitations in teacher supervision and assistance during learning activities.

This situation became more difficult because the PJOK teacher was undergoing a recovery period after appendicitis surgery, as explained by the school principal and mentor teacher at the beginning of the Teaching Assistance Program. The teacher's physical condition caused the PJOK schedule, which originally consisted of three consecutive lesson hours, to be divided into two lesson hours and one additional lesson hour on a different day. In practice, the teacher more frequently assigned tasks and provided practice instructions while supervising students from the side of the field in a seated and resting position. This condition affected the learning process, particularly in students' mastery of movement skills and critical thinking abilities.

Learning problems were also reflected in students' responses at the beginning of the learning activities. Several students expressed happiness because they finally had additional assistance during PJOK lessons and hoped to participate more actively in practical activities on the field. During the teaching assistance activities, the author also found that many Grade VIII students had not yet mastered basic physical fitness movements such as push-ups, sit-ups, ball throwing and catching, and agility exercises through running activities with specific routes. This condition indicates that the physical fitness learning implemented so far has not fully helped students understand the material and movement skills properly. Therefore, more engaging learning activities are needed to increase student involvement during the learning process.

As an alternative learning strategy, the author implemented project-based learning through the Monoraga game (Sports Monopoly) for students in classes VIII A and VIII B during the Teaching Assistance Program. Students were assigned to create the game media in groups for three weeks, after which the media was used in PJOK learning activities. The Monoraga game contains various physical fitness activities that encourage students to understand game rules, select suitable exercises, and connect physical activities with physical fitness concepts. This media was also utilized when learning sessions only lasted for one lesson hour, allowing students to continue learning inside the classroom. Based on observations, students appeared enthusiastic because they were able to play a learning medium that they had designed themselves and that had never previously been used in PJOK learning at the school. These findings are consistent with studies stating that game-based learning can improve student engagement, motivation, and critical thinking abilities (Darwin et al., 2024).

Recent studies have shown that game-based learning and gamification have been increasingly applied in educational settings, including Physical Education, because they can enhance student engagement, motivation, participation, and learning outcomes. A systematic review conducted by Camacho-Sánchez et al. (2023) found that game-based learning in Physical Education contributes positively to students' motivation, academic achievement, and participation in learning activities. However, the review also highlighted the need for further studies examining specific cognitive outcomes beyond physical performance and motivation. Similarly, Mercan and Varol Selçuk (2024) reported that most game-based learning studies in Physical Education primarily focused on enjoyment, participation, and physical activity outcomes, while investigations of higher-order thinking skills remained relatively limited.

Several recent studies have attempted to explore critical thinking in Physical Education. Bayu et al. (2022) demonstrated that instructional approaches involving peer observation, self-assessment, and circuit learning could improve students' critical thinking skills and physical fitness. Likewise, Firmana et al. (2024) reported that integrating traditional sports into Physical Education learning supported the development of critical thinking skills. In addition, Trisnawati et al. (2024) found that interactive learning media contributed to improvements in critical thinking and learning motivation in Physical Education classes. Nevertheless, these studies did not specifically examine game-based Monopoly-type learning media in physical fitness materials, nor did they employ assessment instruments based on Facione's six critical thinking indicators.

Another gap can be identified in studies concerning Monopoly-based learning media. Previous research by Unorrizqo et al. (2025) focused on the development and feasibility of Monopoly-based PJOK learning media for elementary school students and reported positive

results regarding student engagement and conceptual understanding. However, the study did not investigate the effect of the media on critical thinking skills. Therefore, empirical evidence regarding the influence of Monopoly-based learning media on students' critical thinking abilities in physical fitness learning remains limited, particularly at the junior high school level.

The novelty of the present study lies in several aspects. First, this study utilizes the Monoraga (Sports Monopoly) game as a game-based learning medium specifically designed for physical fitness materials in junior high school Physical Education. Second, the study focuses on students' critical thinking abilities rather than solely on physical fitness outcomes or learning motivation. Third, students' critical thinking abilities are measured using Multiple Choice Multiple Answer (MCMA) questions developed based on Facione's six critical thinking indicators, namely interpretation, analysis, evaluation, inference, explanation, and self-regulation. Finally, this study was conducted in the specific context of SMP Negeri 2 Alalak, where learning implementation faces limitations in teacher supervision and instructional support, making the development of alternative learning media highly relevant to classroom needs.

The Monoraga game can also serve as an alternative learning medium when field conditions are unsuitable for outdoor activities, such as during rain or when the schoolyard is affected by tidal flooding. Previous PJOK studies have mostly focused on physical fitness and learning motivation, while studies discussing critical thinking abilities in physical fitness materials remain limited. Therefore, this study was conducted to determine the effect of the Monoraga game (Sports Monopoly) on the critical thinking abilities of Grade VIII students at SMP Negeri 2 Alalak in physical fitness materials through Facione's critical thinking indicators using a pre-experimental research design. Based on the explanation above, the research problem of this study is whether there is an effect of the Monoraga game (Sports Monopoly) on students' critical thinking abilities in physical fitness materials for Grade VIII students at SMP Negeri 2 Alalak.

METHOD

This study employed a quantitative approach using a pre-experimental One-Group Pretest–Posttest Design to examine changes in students' critical thinking abilities following the implementation of the Monoraga game (Sports Monopoly) in physical fitness learning. The study was conducted at SMP Negeri 2 Alalak, Barito Kuala Regency, South Kalimantan. The population consisted of all Grade VIII students, while the sample was selected using purposive sampling. Class VIII E, consisting of 30 students, was chosen based on practical considerations, including schedule availability, accessibility, and suitability for implementing the intervention. In this design, students completed a pretest before the treatment (O_1), participated in learning activities using the Monoraga game (X), and then completed a posttest after the treatment (O_2) (Sugiyono, 2019).

Students' critical thinking abilities were measured using a Multiple Choice Multiple Answer (MCMA) test based on Facione's six critical thinking indicators: interpretation, analysis, inference, evaluation, explanation, and self-regulation (Abidin & Soewondo, 2025). The Monoraga game was used as the treatment instrument and was implemented through group-based learning activities involving discussion, problem-solving, movement challenges, and decision-making related to physical fitness concepts. The MCMA scoring system provided partial credit according to the number of correct answers selected by students, with a maximum score of 72 that was converted into a scale of 0–100 for analysis.

Data were analyzed using IBM SPSS Statistics 31. Descriptive statistics were used to summarize students' pretest and posttest scores. Prior to hypothesis testing, the normality assumption was examined using the Shapiro–Wilk test at a significance level of 0.05 (Ghozali, 2021). Because the data were normally distributed, differences between pretest and posttest scores were analyzed using a paired sample t-test (Nuryadi et al., 2017). Since this study used a one-group pretest–posttest design without a control group, the findings should be interpreted cautiously. Improvements in students' scores indicate changes following the implementation of the Monoraga game, but other factors such as learning experiences, repeated testing, and classroom activities may also have contributed to the observed improvements.

RESULTS AND DISCUSSION

The data in this study were obtained from the results of a critical thinking ability test administered to Grade VIII E students of SMP Negeri 2 Alalak using a Multiple Choice Multiple Answer (MCMA) instrument consisting of 24 items. The test was conducted twice, namely before treatment (pretest) and after treatment (posttest). The study involved 30 students.

Based on the scoring guidelines, there were 18 questions with three correct answers, three questions with two correct answers, and three questions with one correct answer, resulting in a maximum score of 72. Students' scores were converted into a scale of 0–100 by dividing the obtained score by the maximum score and multiplying by 100.

Table 1. Pretest and Posttest Mean Scores

Description	Pre test	Post test
Lowest Score	46,5	61,1
Highest Score	93,8	97,2
Mean Score	77,4	85,9
Improvement	8,5	

Table 2. Mean Scores of Critical Thinking Indicators in the Pretest and Posttest

No	Indikator	Pretest	Post test	Improvement
1	Interpretation	2,49	2,76	0,27
2	Analysis	2,07	2,44	0,37
3	Inference	2,43	2,69	0,26
4	Evaluation	2,52	2,84	0,32
5	Explanation	2,25	2,55	0,30
6	Self-Regulation	2,14	2,39	0,25

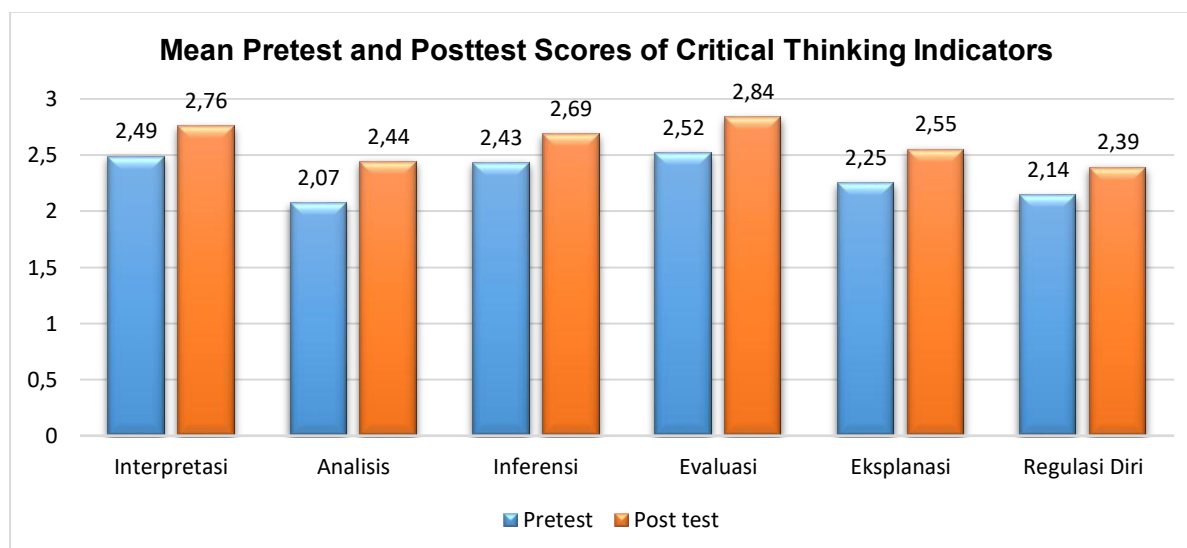


Figure 1. Mean Pretest and Posttest Scores of Critical Thinking Indicators

The results indicate that students' critical thinking abilities improved after participating in learning activities using the Monoraga (Sports Monopoly) game. The mean pretest score was 77.4, while the mean posttest score increased to 85.9, resulting in an average improvement of 8.5 points. The increase in scores suggests that students demonstrated better critical thinking performance after receiving the treatment.

The analysis of each critical thinking indicator also showed positive changes. The interpretation indicator increased from 2.49 to 2.76, indicating improvement in students' ability to understand and interpret information. The analysis indicator showed the largest increase, from 2.07 to 2.44, suggesting that students became more capable of identifying relationships and examining information critically. The inference indicator increased from 2.43 to 2.69, indicating improved ability to draw conclusions from available information. The evaluation indicator increased from 2.52 to 2.84, reflecting better ability to assess information and make judgments. The explanation indicator increased from 2.25 to 2.55, while the self-regulation

indicator increased from 2.14 to 2.39. Overall, all critical thinking indicators demonstrated improvement after the implementation of the Monoraga game.

Before conducting hypothesis testing, the normality assumption for the paired sample t-test was examined using the difference scores between pretest and posttest results. According to statistical procedures for paired sample analysis, normality should be assessed on the distribution of score differences rather than on the pretest and posttest scores separately.

Table 3. Normality Test of Difference Scores

Data	Significance	Description
Difference Scores (Posttest – Pretest)	p = 0.200	Normal

The normality test was conducted using the Shapiro–Wilk test at a significance level of 0.05. The results showed that the significance value of the difference scores (posttest–pretest) was 0.200, which was greater than 0.05. Therefore, the difference scores were normally distributed, and the paired sample t-test was considered appropriate for hypothesis testing.

Table 4. Paired Sample t-Test Results

Data	t	Sig
Pretest-posttest	-5,845	<0,001

Table 5. Paired Sample t-Test Results for Each Critical Thinking Indicator

Data	t	Sig
Interpretation	-3,723	<0,001
Analysis	-4,041	<0,001
Inference	-3,905	<0,001
Evaluation	-5,353	<0,001
Explanation	-4,355	<0,001
Self-Regulation	-3,211	0,002

The paired sample t-test was conducted to compare students' critical thinking abilities before and after the implementation of the Monoraga game. The results revealed a t-value of -5.845 with a significance value of less than 0.001. Since the significance value was below 0.05, the null hypothesis was rejected.

Similarly, all critical thinking indicators demonstrated statistically significant differences between pretest and posttest scores. The significance values for interpretation, analysis, inference, evaluation, and explanation were all below 0.001, while self-regulation showed a significance value of 0.002. These findings indicate that students experienced improvement across all dimensions of critical thinking following the implementation of the Monoraga game.

The largest improvements were observed in the analysis and evaluation indicators. This finding suggests that the game encouraged students to examine information, compare alternatives, make decisions, and evaluate responses during learning activities. Through the game mechanics, students were required to interpret instructions, select appropriate physical fitness activities, discuss answers with peers, and justify their decisions. Such learning experiences may provide opportunities for students to engage in higher-order thinking processes during PJOK learning.

The findings of this study support previous research indicating that game-based learning can promote student engagement and cognitive development. The Monoraga game provided an interactive learning environment in which students actively participated in discussions, problem-solving activities, and decision-making processes related to physical fitness materials. As a result, students demonstrated higher critical thinking scores after participating in the learning activities.

Based on the statistical analysis and descriptive findings, it can be concluded that the implementation of the Monoraga (Sports Monopoly) game was associated with significant improvements in students' critical thinking abilities in physical fitness materials. However, because this study employed a one-group pretest–posttest design without a control group, the findings should be interpreted as evidence of improvement following the intervention rather than as definitive proof of causal influence.

Discussion

The findings of this study indicate that students' critical thinking scores improved after the implementation of the Monoraga (Sports Monopoly) game in physical fitness learning. The mean score increased from 77.4 in the pretest to 85.9 in the posttest, while all six critical thinking indicators also showed higher scores after the intervention. Because this study employed a one-group pretest–posttest design without a control group, these findings should be interpreted cautiously. The results suggest that the implementation of the Monoraga game was associated with improvements in students' critical thinking abilities, although other factors outside the intervention may also have contributed to the observed changes.

The improvement observed in this study may be explained through the characteristics of game-based learning. Educational games create learning situations that encourage students to actively participate in problem solving, collaboration, and decision making. A systematic review conducted by Camacho-Sánchez et al. (2023) reported that game-based learning and gamification in physical education are associated with higher student engagement, motivation, academic performance, and learning participation. These characteristics provide opportunities for students to process information more actively than in conventional learning activities.

The findings can also be understood by examining how the activities contained in the Monoraga game relate to the components of critical thinking. The question cards used during gameplay required students to identify information, understand concepts, and interpret physical fitness problems. These activities may support the development of interpretation skills because students needed to recognize relevant information before selecting answers. Furthermore, students were required to explain and justify their responses during group discussions. This process may contribute to the improvement of explanation skills because students had opportunities to communicate their reasoning and defend their answers in front of peers.

The discussion activities conducted during the game may also explain the improvement in analysis and evaluation indicators. Students were required to compare alternative answers, identify incorrect responses, and determine the most appropriate solutions based on the information provided. Such activities encouraged students to examine relationships among concepts and evaluate the quality of different answers. This explanation is consistent with the finding that analysis showed the highest increase among all indicators, rising from 2.07 to 2.44, while evaluation increased from 2.52 to 2.84.

The inference indicator also demonstrated improvement after the implementation of the Monoraga game. During gameplay, students frequently faced situations requiring them to make decisions based on available information, predict consequences, and determine appropriate actions. Decision-making processes such as these are closely related to inference because students must draw conclusions before selecting answers or strategies. In addition, the movement challenges incorporated into the game connected cognitive reasoning with physical activity. Students were required to relate theoretical knowledge about physical fitness to practical movement tasks, thereby encouraging the application of reasoning during PJOK learning.

Although all indicators improved, self-regulation showed the smallest increase compared with the other critical thinking indicators. This finding is noteworthy because self-regulation involves metacognitive processes such as monitoring, evaluating, and controlling one's own thinking. These abilities generally develop through repeated reflection and sustained practice over a longer period. The relatively limited increase in self-regulation may indicate that the intervention primarily emphasized discussion, problem solving, and gameplay activities, whereas explicit reflection activities were less prominent. Therefore, students may have had fewer opportunities to evaluate their own thinking processes systematically. Previous studies have also suggested that critical thinking dimensions related to metacognition and self-regulation often require longer interventions and structured reflective activities to develop optimally.

The overall findings of this study are consistent with previous research indicating that active and student-centered learning approaches can support the development of critical thinking skills. Camacho-Sánchez et al. (2023) concluded that game-based learning in physical education encourages student engagement and cognitive involvement during learning activities. Similarly, studies on project-based learning have reported that learning

environments involving problem solving, collaboration, and active participation are associated with improvements in students' critical thinking abilities.

Several limitations should be considered when interpreting the findings of this study. First, the study employed a one-group pretest–posttest design without a control group, making it difficult to attribute the observed improvement solely to the Monoraga game. Second, the sample consisted of only 30 students from a single class, limiting the generalizability of the findings. Third, the use of purposive sampling may restrict the representativeness of the sample. Fourth, the duration of the intervention was relatively short, which may have limited the development of certain critical thinking dimensions, particularly self-regulation. Finally, the possibility of a testing effect cannot be excluded because students completed similar assessments during both the pretest and posttest. Future studies are encouraged to employ experimental or quasi-experimental designs with control groups, larger samples, and longer intervention periods to obtain stronger evidence regarding the effectiveness of the Monoraga game in supporting critical thinking development in PJOK learning.

CONCLUSION

Based on the findings of this study, the implementation of the Monoraga game (Sports Monopoly) was followed by an increase in students' critical thinking scores in physical fitness learning among Grade VIII students at SMP Negeri 2 Alalak. The improvement was reflected in the increase in the mean score from 77.4 in the pretest to 85.9 in the posttest. In addition, improvements were observed across all six critical thinking indicators, namely interpretation, analysis, inference, evaluation, explanation, and self-regulation. The largest improvements were found in the analysis and evaluation indicators.

The findings suggest that learning activities involving the Monoraga game may support students' engagement in discussion, problem solving, decision making, and the application of physical fitness concepts during PJOK learning. Through game-based activities, students were provided with opportunities to interpret information, analyze alternatives, evaluate answers, explain reasoning, and make decisions collaboratively.

However, because this study employed a one-group pretest–posttest design without a control group, the findings should be interpreted with caution. The observed improvement cannot be attributed solely to the implementation of the Monoraga game, as other factors may also have contributed to the changes in students' critical thinking scores. Therefore, further research using experimental or quasi-experimental designs with control groups, larger samples, and longer intervention periods is recommended to provide stronger evidence regarding the effectiveness of the Monoraga game in supporting the development of critical thinking skills in PJOK learning.

RECOMMENDATIONS

Based on the findings of this study, several recommendations can be proposed. PJOK teachers are encouraged to utilize instructional media such as the Monoraga game to enhance student engagement and critical thinking abilities in learning activities. Students are expected to participate more actively in learning activities and use educational games as a medium for understanding learning materials. Schools are encouraged to support the use of creative instructional media and provide facilities that support the implementation of PJOK learning activities. For future researchers, this study may be further developed by involving larger sample sizes, using comparison groups, and developing other forms of games in PJOK learning. This study may also serve as a reference for the development of game-based learning related to students' critical thinking abilities.

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