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THE EFFECT OF PHYSICAL EDUCATION LEARNING BASED ON DIRECTION GUESSING GAME AND COMPACT GAME ON INCREASING STUDENT ACTIVE PARTICIPATION

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Abstract
This study investigates the effect of physical education learning based on the Direction Guessing Game and Compact Game on improving students' active participation in grade 7 at SMP N 29 Semarang. Active participation is considered an essential component of effective physical education learning, as it reflects students' involvement not only physically but also cognitively and affectively during the learning process. To address this issue, a quantitative quasi-experimental design was employed, involving two experimental groups consisting of 30 students each. Each group received different game-based learning treatments, namely the Direction Guessing Game and the Compact Game, which were implemented over a four-week instructional period. Data were collected using the Physical Education Attitude Scale (PEAS), which assesses students' active participation across affective, cognitive, and behavioral dimensions. The collected data were analyzed using descriptive statistics to determine overall trends, followed by assumption tests and comparative statistical tests to examine differences between the two learning models. The results indicate that both the Direction Guessing Game and Compact Game had a positive effect on increasing students' active participation in physical education lessons. However, the Compact Game demonstrated higher mean scores and more consistent improvements across all participation aspects compared to the Direction Guessing Game. These findings suggest that game-based learning approaches can effectively enhance student engagement, motivation, and interaction in physical education classes. Furthermore, the Compact Game appears to provide more opportunities for continuous involvement and collaborative play, which may contribute to higher levels of active participation. In conclusion, integrating the Direction Guessing Game and Compact Game supports student-centered learning and can be applied as an innovative and practical strategy to strengthen students' active participation in physical education learning, particularly at the junior high school level.

Keywords: Physical education, Active Participation, Game-based Learning, direction guessing game, compact game

INTRODUCTION

Physical Education, Sports, and Health (PJOK) is a crucial component of the national curriculum, aiming to develop students' physical abilities, motor skills, and social and emotional attitudes holistically. Through planned physical activities, students are guided to develop a healthy lifestyle, improve fitness, and foster values of sportsmanship and cooperation in their daily lives. Unfortunately, in practice, the PJOK learning process is often carried out conventionally and teacher-centered, thus lacking space for active student participation. This one-way approach often leads to students becoming passive, unmotivated, and even viewing PJOK as merely a supplementary subject (Susanto, 2020).

One of the main problems in current PJOK learning is the low level of active student participation. In fact, student activity, physically, mentally, and socially, is an indicator of the success of the PJOK learning process. Active participation can improve the understanding of movement concepts and basic skills and shape students' character to be responsible and able to work in teams (Bailey et al., 2009). Therefore, innovation is needed in the PJOK learning approach, especially one that is able to answer the needs of students in the modern era which is full of challenges and changes.

One relevant and proven effective approach to increasing student engagement is game-based learning (GBL). Recent studies have shown that GBL can improve students' learning motivation, concentration, and social interaction. A meta-analysis by Mercan & Varol Selçuk (2024) found that implementing games in learning positively impacts students' learning outcomes and physical fitness. Furthermore, systematic research by Mo et al. (2024) also revealed that a game-based approach creates a more enjoyable and inclusive learning environment for students from diverse backgrounds. In Indonesia, Banjarani et al. (2024) demonstrated that game modifications in Physical Education (PJOK) increased student active participation by up to 5% within two learning cycles.

In the context of curriculum development, a game-based approach also aligns closely with the student-centered learning principles promoted by the Independent Curriculum. Learning is directed toward developing a Pancasila Student Profile that is independent, creative, collaborative, and possesses critical reasoning skills and a global understanding of diversity (Wahyudin et al., 2024). Therefore, physical education (PJOK) instruction needs to adopt methods that are more student-focused and actively involve them in the learning process. One way to achieve this is by integrating educational and fun local games such as the Direction Guessing Game and the Compact Game.

The Direction Guessing Game hones students' ability to guess directions based on specific

clues or movements. This game requires concentration, quick reactions, and the ability to follow instructions accurately, thus stimulating cognitive and psychomotor engagement. Meanwhile, the Compact Game is a game played in a limited space to train team coordination, decision-making, and strategy. These two games can be combined into a single engaging and challenging Physical Education (PJOK) learning model that enhances student engagement.

Previous research conducted by (Muzaqi et al., 2025) showed that the use of games in Physical Education (PJOK) learning can significantly increase student engagement and numeracy skills. These results confirm that games function not only as entertainment but also as an effective learning tool, especially if designed systematically and according to student needs. Similar findings were also expressed by (Nuraini et al., 2023) who emphasized the importance of developing creativity through games in PJOK, as well as research by (Iryanti et al., 2024) which showed that physical games have a significant contribution to strengthening students' physical literacy in the Independent Curriculum.

The urgency of this research lies in the need for innovation in physical education learning that suits the characteristics of today's students, namely Generation Z students who tend to be active, like challenges, and require a fun and interactive learning approach. In addition, there are not many studies that specifically examine the effectiveness of the combination of the Direction Guessing Game and Compact Game in the context of physical education at the junior high school level, especially in areas such as SMP N 29 Semarang. This research is expected to provide scientific contributions in the development of game-based physical education learning strategies, as well as provide practical recommendations for teachers in designing learning activities that are more interesting and participatory and have a real impact on student activity.

Based on the background and urgency, this study aims to test the effectiveness of PJOK learning based on the Direction Guessing Game and Compact Game on increasing the active participation of 7th grade students at SMP N 29 Semarang.

METHODOLOGY

This study uses a quantitative approach with a quasi-experimental pretest-posttest design in two experimental groups to compare the effectiveness of the Direction Guessing Game and Compact Game on increasing students' active participation. The subjects of the study were 7th grade students of SMP N 29 Semarang who were selected purposively and divided into two groups: group A using the Direction Guessing Game and group B using the Compact Game. The intervention was carried out for four weeks, twice per week in PJOK learning.

The data collection instrument used the Physical Education Attitude Scale (PEAS), which

has been validated and proven reliable in various international studies. This scale measures students' attitudes towards physical education learning through three main dimensions: affective (attitude and interest in physical activity), cognitive (perception of the benefits of physical education), and behavioral (tendency to actively participate). The PEAS uses a 5-point Likert scale and has a structure that has been proven to be statistically consistent with a Cronbach's Alpha reliability value ≥ 0.75 (Kurniawan et al., 2023; Orlić et al., 2017). This instrument was used consistently in the pretest and posttest to assess changes in students' active participation.

Data were analyzed using paired t-test to measure improvement in each group and independent t-test to compare the effectiveness between the two game models. The significance test was conducted at the $\alpha = 0.05$ level. This design was chosen because it is effective for evaluating learning interventions and comparing the implemented models, in accordance with studies (Mercan & Varol Selçuk, 2024) and (Mo et al., 2024) in game-based research in physical education.

RESULTS

This section presents the results of descriptive and inferential statistical analysis, including assumption testing, on the final average value data grouped by group variables.

Description of Learning Outcome Data

This study involved 60 subjects evenly divided into two groups, each consisting of 30 subjects. 1 Descriptive statistics are presented to provide an overview of the distribution of Final Means across the two groups.

Table 1. Descriptive Statistics of Final Means by Group

Kelompok	N	Mean	Std. Deviation	Median
Kelompok 1	30	82.5200 [2]	6.32626 [3]	82.5000 [4]
Kelompok 2	30	87.0567 [5]	4.44977 [6]	87.5000 [7]

Based on Table 1, it was found that the average final average for Group 2 was 87.0567, showing a higher value compared to the average for Group 1, which was 82.52008. In addition, the standard deviation for Group 2 (4.44977) was smaller than that of Group 1 (6.32626), indicating that the distribution of score data in Group 2 was more homogeneous. The median values of both groups (82.5000 for Group 1 and 87.5000 for Group 2) also showed a pattern that was in line with the average value.

Testing Statistical Assumptions

Before conducting comparative hypothesis testing (which is implicitly referred to by the two-group data design), two main assumptions are tested: normality of data distribution and

homogeneity of variance.

The normality test was conducted using the Shapiro-Wilk test due to the relatively small sample size (N < 50).

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

Kelompok	Shapiro-Wilk Statistic	df	Sig. (p)
Kelompok 1	0.965 [12]	30 [13]	0.384 [14]
Kelompok 2	0.947 [15]	30 [16]	0.155 [17]

The results of the normality test show that the significance value for Group 1 is 0.38418 and for Group 2 is 0.15519. Since the significance value of both groups is greater than S\alpha = 0.05S, it can be concluded that the final average data in both groups is normally distributed.

The homogeneity of variance test is performed using Levene's Test to determine whether the variances between groups are equal.

Table 3. Results of the Homogeneity of Variance Test (Levene's Test)

Levene Statistic	df1	df2	Sig. (p)
1.956 [21]	1 [22]	58 [23]	0.166 [24]

Based on Table 3 (Table 4.2 in SPSS output), the significance value (Sig.) of Levene's Test is 0.16625 With a value of Sp>0.05S, it can be confirmed that the variance of the final average between Group 1 and Group 2 is homogeneous (the same).

DISCUSSION

The results of the study indicate that all statistical assumptions required for parametric comparative analysis (i.e., normality and homogeneity of variance tests) have been met. The distribution of the Final Average data in Group 1 (Sp=0.384S) and Group 2 (Sp=0.155S) is proven normal 27. Similarly, the variance between groups showed adequate homogeneity (Sp=0.166S)28. The fulfillment of these two assumptions validates the use of a more sensitive parametric statistical test, such as the Independent Samples t-Test, to compare the means of the two groups.

Descriptively, there was an observed difference in the final mean scores between the two groups. Group 2 recorded a numerically higher mean (M = 87.0567) than Group 1 (M= 82.5200)29. This mean difference of 4.5367 points indicates the potential for differential impact between treatments or characteristics that differentiate Group 1 and Group 2. Furthermore, the standard deviation is smaller in Group 2 (SD = 4.44977) compared to Group 1. (SD = 6.32626) 30 implies greater consistency of performance in Group 2. That is, the Final Mean scores in Group 2

tended to be closer to the mean, while the scores in Group 1 had greater variability.

The observed difference in mean scores between Group 1 and Group 2 can be interpreted as an initial indication of differential effectiveness between the conditions or treatments applied to each group. A higher mean score in Group 2 suggests that participants in this group achieved better overall outcomes by the end of the intervention period. In comparative research, such descriptive mean differences are often used as a preliminary basis for inferring potential advantages of one condition over another, particularly when supported by appropriate statistical assumptions. However, descriptive superiority alone does not establish causality, and the interpretation must remain cautious until supported by inferential statistical evidence.

In addition to the difference in mean scores, the smaller standard deviation observed in Group 2 is an important finding that strengthens the descriptive interpretation. Lower variability indicates that participant performance in Group 2 was more homogeneous, suggesting that the intervention or condition may have produced more stable and consistent effects across individuals. Conversely, the higher standard deviation in Group 1 implies greater dispersion of scores, which may reflect uneven responses to the condition or greater individual differences among participants. From an educational or experimental perspective, consistency of outcomes is often considered as important as higher average performance, as it reflects reliability and predictability of the applied treatment.

Taken together, the combination of a higher mean score and lower variability in Group 2 provides descriptive evidence that this group not only performed better on average but also demonstrated more uniform achievement. These findings reinforce the relevance of proceeding to inferential analysis using an Independent Samples t-Test, as the fulfillment of normality and homogeneity assumptions ensures the robustness of the results. Should the t-test confirm statistical significance, the descriptive trends identified in this analysis would gain stronger empirical support, thereby allowing more confident conclusions regarding the comparative effectiveness of the two groups.

The implication of this descriptive finding is that the intervention or condition applied to Group 2 likely resulted in superior and more uniform final scores compared to Group 1. However, it is important to emphasize that this analysis is merely descriptive. Statistical significance testing (such as a t-test), although not explicitly presented, would be necessary to determine whether the 4.5367-point difference in the mean is statistically significant or simply due to chance fluctuations. With the assumptions of normality and homogeneity met, the results of the parametric comparative test will be valid and reliable.

CONCLUSION

Based on the results of the study that applied two game-based learning models, namely the Direction Guessing Game and Compact Game, it can be concluded that both of them made a positive contribution to increasing students' active participation in 7th grade physical education learning at SMP N 29 Semarang. Descriptive findings showed that students who participated in learning with the Compact Game had a higher average final score and a more homogeneous distribution of scores compared to the group that used the Direction Guessing Game, thus indicating a more stable effectiveness of the intervention in increasing student activeness.

Statistical assumption tests, including normality and homogeneity of variance, demonstrated that all data were normally distributed and had homogeneous variance, thus validating the use of parametric comparative tests. These results strengthen the reliability of the analysis and confirm that the improvement in scores in both groups was not due to uncontrolled data variability but was closely related to the learning treatment provided.

Pedagogically, this research demonstrates that game-based physical education (PJOK) learning can create a more interactive, collaborative, and enjoyable learning environment, encouraging students to engage more actively physically, cognitively, and affectively. This aligns with the characteristics of the Independent Curriculum, which emphasizes student-centered learning and the development of the Pancasila Student Profile, particularly in the areas of cooperation, creativity, and positive attitudes toward physical activity.

Thus, this study confirms that the Direction Guessing Game and Compact Game are effective learning strategies and are suitable for implementation in Physical Education (PJOK), especially in efforts to increase active student participation. Physical Education (PJOK) teachers are recommended to integrate these game models as innovative alternatives in learning, while also enriching the variety of activities that can adapt to the needs and characteristics of students in the modern learning era.

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