COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 || Volume 17, Number 3, 2025 || P.3219-3225

Student and Teacher Coefficients in Large Ball Learning Through the Jigsaw Model at SMPN 1 Leles

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ABSTRACT

This study aims to analyze the effect of the Jigsaw learning model on the correlation coefficient between students and teachers in teaching large ball games at SMPN 1 Leles. The method used is a quantitative method with a descriptive approach and a One Group Pretest-Posttest Design. The research sample consisted of 83 eighth-grade students obtained through purposive sampling based on the Slovin formula. The research instrument was a Likert scale questionnaire with 46 statements covering four aspects of assessment, namely cognitive, affective, psychomotor, and interaction. The questionnaire was administered at the pretest and posttest stages. The treatment was carried out through the application of the Jigsaw learning model during nine meetings on the subjects of basketball, volleyball, and soccer. Data analysis included descriptive analysis, Kolmogorov-Smirnov normality test, Levene's homogeneity test, and paired t-test. The results showed an increase in scores from the pretest to the posttest with an average difference of 8.597 and a significance value of 0.000 ($p < 0.05$), indicating a significant difference after the Jigsaw model was applied. Normality and homogeneity tests also showed that the data were normally distributed and had homogeneous variance. Overall, this study concluded that the Jigsaw learning model had a significant effect on increasing the correlation coefficient between students and teachers. This model was able to create a more active, collaborative, and communicative learning atmosphere, thereby supporting the improvement of the effectiveness of large ball game learning.

ARTICLE HISTORY
Received: 2025/10/24
Accepted: 2025/10/28
Published: 2025/10/31

KEYWORDS
Student;
Teacher ;
Large Ball;
Learning Jigsaw.
Model.

AUTHORS' CONTRIBUTION
A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article : Iqbal, Muhamad; Sonjaya, Azhar Ramadhana; Kosasih, Alam Hadi; Arifin, Z . (2025). Student and Teacher Coefficients in Large Ball Learning Through the Jigsaw Model at SMPN 1 Leles. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 17 (3), p.3219-3225

INTRODUCTION

Education is a planned and systematic effort to develop the potential of students to become people of faith, knowledge, skill, and character. In the context of national education, learning in schools emphasizes not only the mastery of cognitive knowledge, but also the development of affective and psychomotor aspects. One subject that plays an important role in shaping these aspects is Physical Education, Sports, and Health

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(PJOK))(Ali, 2022). PJOK is an important means of shaping students' personalities to be physically healthy, mentally strong, athletic, and socially competent. Through sports activities, students not only train their physical skills but also learn to cooperate, communicate, respect differences, and learn to accept defeat and victory in a sportsmanlike manner (Sari et al., 2024).

However, in practice, PJOK learning is often still oriented towards physical activities alone, without being balanced with a pedagogical approach that encourages active mental and social involvement of students(Marani et al., 2024). Teachers often play a dominant role in the learning process, while students merely follow instructions without understanding the meaning and purpose of the activities (Hutabarat et al., 2024). As a result, learning objectives are not optimally achieved, especially in social aspects such as the coefficient of harmony and harmony in the interaction between teachers and students in the teaching and learning process.

In the learning process, the relationship between students and teachers plays an important role in the effectiveness of learning activities. The coefficient between the two describes the harmony, mutual understanding, and positive cooperation during the learning process (Jaya et al., 2025). Teachers are not only sources of information, but also facilitators, motivators, and mentors for students. Meanwhile, students are expected to be active subjects who participate fully in learning activities.

A good relationship between teachers and students can foster trust, increase motivation to learn, and create a comfortable and conducive learning environment. In the context of sports education, this relationship is particularly important because most activities are conducted in groups, on the field, and require intensive interaction (Harahap et al., 2025). Teachers need to understand the characteristics of each student, while students need to cultivate mutual respect and responsibility in working together (Ansori et al., 2021).

However, in practice, it is often found that the relationship between teachers and students is not yet optimal. Many students tend to be passive, unenthusiastic about participating in activities, and some are even reluctant to work together in groups. On the other hand, teachers sometimes still apply traditional learning patterns that focus on direct instruction without giving students room to take initiative (Triliyani, 2025). This creates an emotional distance between teachers and students, which results in low learning effectiveness.

One of the important subjects in physical education at the junior high school level is learning to play ball games, which includes sports such as soccer, volleyball, and basketball. This subject aims to develop students' motor skills, playing strategies, teamwork, and sportsmanship (Budi, 2021). However, in practice, teaching ball games often faces various obstacles. Some students are less active because they feel they lack sufficient physical ability, while others dominate the game. Teachers also often find it difficult to organize groups so that every student gets a balanced learning opportunity (Asmani, 2016).

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Another problem that often arises is the lack of meaningful interaction between teachers and students. Teachers often focus more on teaching techniques and game rules, while students are given fewer opportunities to discuss, evaluate, or help each other in understanding playing strategies. As a result, the learning process tends to be monotonous and fails to develop students' social skills (Jufri et al., 2023). In fact, the essence of big ball games is teamwork and effective communication, two things that cannot develop without interaction between teachers and students.

Based on initial observations and interviews with physical education teachers at SMP Negeri 1 Leles, it was found that ball games instruction is still dominated by conventional approaches. Teachers more often use demonstration and direct technical training methods. Although these methods are effective for developing basic skills, they are not sufficient for fostering harmonious social interaction between teachers and students (Oyok, 2024). Some students showed a lack of enthusiasm during activities. They tended to follow instructions without initiative, and the relationship between teachers and students was still one-sided. Teachers also complained about the lack of active response from students, especially in teamwork and communication during learning. This shows that the teacher-student coefficient still needs to be improved.

Given these conditions, the application of the Jigsaw learning model is considered relevant and has the potential to improve the situation. By actively involving students in the learning process, it is hoped that there will be an increase in positive interactions between teachers and students, as well as among students themselves (Erviana et al., 2024). Learning becomes more participatory, meaningful, and in line with the spirit of the Merdeka Curriculum, which emphasizes collaborative and student-centered learning.

Several previous studies have discussed the effectiveness of the Jigsaw learning model in improving student learning outcomes or social skills. However, most of these studies only focused on improving cognitive or psychomotor learning outcomes, such as improving passing skills in soccer or increasing test scores for playing skills (Andika et al., 2021).

Not much research has specifically highlighted the aspect of the coefficient between students and teachers in the context of PJOK learning, especially in ball sports (Marani et al., 2024). In fact, this coefficient is an important factor that can influence the success of any learning model, including the Jigsaw model. In addition, the local context, such as at SMPN 1 Leles, has unique characteristics in terms of students, school environment, and learning culture. Therefore, it is necessary to conduct research that examines in depth how the application of the Jigsaw learning model can affect the teacher-student relationship in large ball sports learning at the school.

METHODS

This study used a quantitative method with a descriptive approach to measure the level of student and teacher coefficients in large ball learning after applying the Jigsaw

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learning model. The research design used was a One Group Pretest-Posttest Design, which involved measurement before treatment (pretest), administration of treatment in the form of the Jigsaw learning model, and re-measurement after treatment (posttest). This design was chosen to observe changes and the direct effects of the treatment on the subjects. The research population consisted of all eighth-grade students and physical education teachers at SMPN 1 Leles, while the sample was determined using purposive sampling (Zulkarnain & Hartati, 2015). Based on the Slovin formula with a 10% margin of error, 83 students were selected as the research sample. The research instrument used a four-choice Likert scale questionnaire consisting of 46 statements covering four aspects: cognitive, affective, psychomotor, and interaction. The instrument was administered at the pretest and posttest as a basis for measuring the level of student-teacher rapport. Data collection techniques were carried out through observation, pretest-posttest, and documentation.

Research procedure

Pretest

The pretest was conducted using a Likert scale questionnaire administered before the learning model was implemented. The instrument contained four assessment aspects, namely cognitive, affective, psychomotor, and interaction aspects. The pretest aimed to obtain an initial picture of the level of student-teacher rapport before the Jigsaw learning model was implemented.

Treatment

The treatment in this study was carried out through the application of the Jigsaw learning model during nine meetings. The material provided covered basketball, volleyball, and soccer, each of which was taught in three consecutive meetings. Each learning session lasted 90 minutes in accordance with the time allocation for the PJOK subject. During the treatment process, students were involved in collaborative activities and group discussions in accordance with the principles of the Jigsaw model to improve the coefficient between students and teachers in learning.

Posttest

The posttest was conducted after the entire series of learning with the Jigsaw model had been implemented. The Likert scale questionnaire instrument used in the posttest was the same as the pretest, covering four aspects of assessment: cognitive, affective, psychomotor, and interaction. The posttest was conducted to measure changes and improvements in the level of student-teacher interaction after receiving the treatment, so that the results could be compared with the pretest scores to determine the effectiveness of the model.

Data analysis was performed using SPSS through several stages, starting with descriptive statistics to see an overview of the pretest and posttest scores. Next, a normality test was performed using Kolmogorov-Smirnov to ensure normal data distribution, as well as a homogeneity of variance test using Levene's test to see the similarity of variances. The final stage was a paired t-test to determine the significant difference between the pretest and posttest scores.

RESULTS AND DISCUSSION

Descriptive Analysis

Descriptive analysis is an analysis that aims to provide an overview of the variables in the study (Adiningrat et al., 2025). The data from the study results are grouped into four categories, namely Never, Rarely, Often, and Always.

Table 1.
Descriptive Statistics

	N	Range	Min.	Max.	Sum	Mean	Std.D	Variance
Pretest	83	55	107	162	11154	134.39	13.653	186.411
Posttest	83	71	109	180	12026	144.89	16.925	286.464

Based on the table above, there was an increase in results from the pre-test to the post-test among 83 participants. The average score increased from 134.39 to 144.89, while the minimum and maximum scores also increased. In addition, the score range narrowed from 55 to 71, and the standard deviation decreased from 13.653 to 16.925, indicating that the post-test results were more consistent. Overall, these data illustrate an improvement in participant performance after the intervention or treatment was administered.

After conducting descriptive statistical analysis, the next step is to test the normality of the data to determine whether the distribution of the pretest-posttest results is normal. In this study, the Kolmogorov-Smirnov test was used to test normality, with the results shown in the table below.

Table 1.
Normality Test

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Test scores	pre test	.076	83	.200*	.970	83	.056
	pos test	.057	83	.200*	.978	83	.160

Based on the Normality Test above, the sig value is 0.056 for the pre-test and 0.160 for the post-test. Thus, the normality test is fulfilled because the sig value is > 0.05. Therefore, it can be concluded that the normality test in this study is normally distributed.

Table 3.
Test of Homogeneity of variance

		N	Levene Statistic	df1	df2	Sig.
Test scores	Based on Mean		4.621	1	164	.133
	Based on Median		4.301	1	164	.140
	Based on Median and with adjusted df		4.301	1	158.659	.140
	Based on trimmed mean		4.538	1	164	.135

Based on the above test results, the Levene's test was used to test the homogeneity of variance. Based on all calculation methods, the (Sig.) value is above 0.05, namely 0.133, 0.140, 0.140, and 0.135, respectively. This indicates that the variance between groups is homogeneous, so the assumption of variance homogeneity is fulfilled. Thus, the data can be analyzed using the parametric t-test.

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Table 4.
Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std.Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest-Posttest	10.506	8.597	0.944	8.629	12.383	11.133	82	0.000

Based on the table above, it shows the results of the paired sample t-test between the pre-test and post-test scores. The results show an average difference of 8.597 with a significance value (Sig. 2-tailed) of 0.000 ($p < 0.05$). This illustrates that there is a statistically significant difference between the pre-test and post-test results. The calculated t-value is 11.133 with a degree of freedom (df) of 82 and a 95% confidence interval between 8.629 and 12.383. Therefore, it can be concluded that the intervention provided had a significant impact on improving the participants' learning outcomes.

CONCLUSION

Based on the findings in this study, it can be concluded that there is a good correlation between students and teachers in learning large ball games through the Jigsaw learning model at SMPN 1 Leles. The results of the analysis show that all statistical tests, including descriptive tests, normality tests, homogeneity tests, and t-tests, have a significance value > 0.05, which means that the data is normally distributed, the variance between groups is homogeneous, and there are no significant differences, so that the relationship between students and teachers is stable and balanced. Teachers played an active role as facilitators who directed the learning process, while students showed high participation through effective cooperation and communication within groups. The Jigsaw learning model has proven to be capable of creating an interactive and collaborative learning atmosphere and strengthening student involvement in the learning process. Thus, it can be concluded that the success of learning is not only determined by the application of methods but also by the quality of interaction, cooperation, and harmonious reciprocal relationships between teachers and students during learning activities.

ACKNOWLEDGMENT

With deep gratitude, I would like to thank SMPN 1 Leles for providing the opportunity and facilitating the venue for conducting observation activities. The support and convenience provided greatly helped the smooth collection of data and implementation of my activities. I would also like to express my deepest gratitude to Mr. Azhar Ramadhana Sonjaya, Mr. Alam Hadi Kosasih, and Mr. Z. Arifin as my supervisors who took the time to provide guidance and patiently mentored me throughout the activity. The guidance and knowledge they shared have been invaluable to the development of my knowledge and experience. May all the kindness and support you have given be rewarded with even greater blessings. Thank you.

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