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*Articles*

# The Effectiveness of Reciprocal Learning Methods on Volleyball Passing Skills in Class V Elementary School Students

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**ABSTRACT**

The aim of the research was to determine the effectiveness of the reciprocal learning method on volleyball passing skills in class V students of Madrasah Ibtidaiyah Negeri. The research method uses *a quasi-* experiment with a *posttest only control design*. Data collection techniques using volleyball passing skills tests and documentation. Data analysis uses validity and reliability. Prerequisite analysis uses the normality test, homogeneity test, and t test. The results of research from hypothesis testing show that the *posttest results* of students in the experimental class obtained a score of 72 while those in the control class obtained a score of 62. The lowest score for the experimental class was 52 and the control class obtained a score of 47. The mean central tendency measure for the experimental class was 60.43 and for the control class amounting to 53.70. The size of group variation which includes the range for the experimental class is 20 and the control class is 15. Using the reciprocal learning method is more effective than the *scientific learning model*. It can be concluded that there is a difference in the

effectiveness of volleyball passing skills using the reciprocal learning method and the average volleyball passing skills of students in the experimental group and the control group.

## 1. Introduction

Education cannot be separated from the learning process which includes education and the learning environment which mutually influence each other in order to achieve learning goals (Istiqlal, 2017; Julaeha, 2019). Learning can be said to be the result of cognitive memory and metacognition which influence understanding (Kusuma & Baskara, 2022; Rohayati, 2018). This is what happens when someone is studying and this condition also often occurs in everyday life. Learning is not an activity that someone does when they are not doing other activities, nor is learning something that someone stops doing. Learning can occur anywhere and at different levels individually, collectively and socially (Helmi, 2016; Rosidah, 2017). One form of learning is information processing, this can be analogous to our mind or brain which acts like a computer where there is input and storage of information in it which is carried out by our brain so that we can retrieve the information material in the form of images or writing (Harefa et al., 2020; Purnama, 2020; Sulistyawati, 2018).

The success or failure of learning activities depends on the teacher's way of teaching based on the competency objectives to be achieved so that the material presented by the teacher can be conveyed accurately and is easily understood by students. Sport is a necessity for human life, if someone does it regularly it will have a good influence on their physical development (Sepriadi, 2017). Apart from that, sport is useful for human physical growth and development, it also has an influence on spiritual development, this influence can provide work efficiency for the body's organs, so that blood circulation, breathing and digestion become regular.

PJOK (Sports and Health Physical Education) learning is an educational process that utilizes physical activity to achieve changes in a person's quality, both physically, mentally and emotionally (Erfayliana, 2017; Mustafa & Dwiyogo, 2020; Saleh & Malinta, 2020; Taufan et al., 2018). Learning PJOK in formal educational institutions can form the seeds of superior athletes from an early age. The problem that is often encountered in PJOK learning is the lack of a learning process in terms of the lack of facilities and infrastructure in schools, because they are limited in quantity and quality (Liana, 2020). Another influence is the lack of support in terms of ability, creativity and innovation of PJOK teachers as learning implementers (Agung, 2017). Apart from that, there are also other factors such as limited infrastructure in schools, the time allocation given is very limited, so that various kinds of learning methods are needed to be used as a learning process. One of the learning methods that can be used to overcome these limitations is the reciprocal method (Carey et al., 2023). This allows students to improve learning

outcomes and social interactions among other friends .In line with the demands that must be carried out as a teacher, namely that you must arouse students' enthusiasm for learning, a sense of mutual cooperation, and the ability to think among students and always provide innovation in every learning activity (Zitha et al., 2023). Due to the very modern development of the world of education, it is not possible for learning to only be centered on the teacher, while students tend to be passive. Using inappropriate learning methods causes students to have difficulty in learning PJOK skills, therefore using appropriate learning methods can require students to be creative and able to work together in groups so that students get maximum skills.

According to (Al-Ajeely et al., 2023) that method learning is a plan or pattern that can be used to build a curriculum, to design the required learning materials, and to guide teaching in the classroom or other learning situations. In volleyball, there are several basic techniques that must be mastered. The techniques in playing volleyball consist of serve, lower pass, upper pass, block and smash. Passing is a player's effort or effort by using a certain technique as an initial step to develop an attack pattern against the opposing team, the aim of which is to get the ball to a friend as quickly as possible to play on their own field (Kusumah, 2018). Based on an interview at MIN 2 Bandar Lampung, namely Mr. R, it is known that the learning methods used by teachers in passing the ball are varied and have used learning media to support learning. Even so, students still have difficulty understanding the subject matter, this results in students' skills in passing volleyball still not reaching the Minimum Completeness Criteria (KKM). On the other hand, it is known that skills in subjects PJOK seen from the practice scores in the field obtained by students is still not optimal. The value of practice in the field has been achieved by class V students MI N 2 Bandar Lampung of the 57 students who got a score > 70 were 23 students with a percentage of 38% and those who got a score < 70 were 34 students with a percentage of 62%. This shows that the learning process has not shown satisfactory results because more than some students still get PJOK practice scores below the average, namely 70.

There is previous research that researchers found discussing the reciprocal method, namely (Irwanto, 2017; Maulana et al., 2023; Perdana, 2023; Riyadi et al., 2023)in this study that there was an increase in ball passing skills and student learning outcomes after using the reciprocal method. From previous research, the author wanted to try out the reciprocal method on a different subject, namely on class V students of Madrasah Ibtidaiyah Negeri. The aim of this research is to determine the effectiveness of the reciprocal learning method on volleyball passing skills in class V students of Madrasah Ibtidaiyah Negeri.

## 2. Method

The research method uses a quantitative approach, a *quasi-experimental type of research* with a *posttest only design*. Quantitative research is a research method used to find the effectiveness of certain treatments on others in controlled situations

or trying to find the effectiveness of certain variables on other variables in strictly controlled situations (Asyafah, 2019; Mutmainah et al., 2022). The research population was all class V students. The samples in the research were taken from two classes, namely class VA and class VB using the reciprocal method. Sampling used the *cluster random sampling technique*. Data collection techniques were carried out by means of questionnaire tests and documentation. Instrument testing uses validity and reliability tests, while analysis prerequisite tests use normality tests with the *Kolmogorov Smirnov test, homogeneity tests with the Barlett* test , and hypothesis tests use the t-test at a level of $\alpha$= 0.05 using the *pooled variance t-test formula* .

## 3. Results and Discussion

Volleyball passing skill scores were obtained by conducting test questions consisting of 1 8 volleyball passing skill test questions on students outside the research sample who had received the learning materials. The trial was carried out on 30 class V students MIN 2 Bandar Lampung on November 20 2023. The data from the trial results were then analyzed to determine the characteristics of each question item which included validity tests, reliability tests, difficulty level tests, and different power tests.

*Product moment was* correlation formula. The results of the validity analysis of the test items for volleyball passing skills can be seen in table 4.1 below:

Table 1. Validity of Test Items

| No | $R_{count}$ | $R_{table}$ | Information |
|---|---|---|---|
| 1 | 0.467 | 0.361 | Valid |
| 2 | 0.556 | 0.361 | Valid |
| 3 | 0.467 | 0.361 | Valid |
| 4 | 0.561 | 0.361 | Valid |
| 5 | 0.373 | 0.361 | Valid |
| 6 | 0.019 | 0.361 | Invalid |
| 7 | 0.418 | 0.361 | Valid |
| 8 | 0.065 | 0.361 | Invalid |
| 9 | 0.525 | 0.361 | Valid |
| 10 | 0.377 | 0.361 | Valid |
| 11 | 0.422 | 0.361 | Valid |
| 12 | 0.146 | 0.361 | Invalid |
| 13 | 0.524 | 0.361 | Valid |
| 14 | 0.419 | 0.361 | Valid |
| 15 | 0.365 | 0.361 | Valid |
| 16 | 0.570 | 0.361 | Valid |

| | | | |
|---|---|---|---|
| 17 | 0.472 | 0.361 | Valid |
| 18 | 0.488 | 0.361 | Valid |

Based on the table, it is known that from 1 8 question items the description shows that there are question items that are included in the invalid criteria because *the Pearson Correlation* ≤ $r_{tabel}$, $r_{tabel}$which is used is = 0.361 , so questions number 6, 8 and 12 are invalid. This shows that the question items cannot be used as test questions for collecting data on research samples. Invalid questions are considered to have no function as a good measuring tool in measuring students' understanding of concepts. Question items number 1,2, 3, 4, 5, 7, 9, 10, 11, 13, 14 , 15, 16, 17 and 1 8 are classified as valid questions because *the Pearson Correlation* is >0.361 so they can be used in data collection understanding ball passing skills .

Based on the results of reliability test calculations using SPSS, *the Cronbach alpha value was obtained*, namely 0.760. If the *Cronbach alpha value* >$r_{tabel}$it can be concluded that the instrument is reliable. The *Cronbach alpha* value is compared to $r_{tabel}$= 0.361 . Seen in the following table:

Table 2. Reliability Test

| **Reliability Statistics** | |
|---|---|
| Cronbach's Alpha | N of Items |
| ,760 | 15 |

The results of reliability statistics show that the *Cronbach's Alpha value* for the scale measured is 0.760, with a total of 15 items. This *Cronbach's Alpha value* indicates a fairly good level of reliability or internal consistency of the scale. In this context, a value above 0.7 is considered adequate to indicate that the items in this scale are consistent in measuring the same construct. Thus, it can be concluded that the scale with 15 items has quite good reliability, making it a reliable measuring tool for further research.

The test of students' volleyball passing skills was used to see how much reciprocal method treatment was carried out in the experimental class, so the following results were obtained:

Table 3. List of *Posttest Scores* for Experimental Class

| **No** | **Code** | ***Posttest*** |
|---|---|---|
| 1 | B-1 | 62 |
| 2 | B-2 | 60 |
| 3 | B-3 | 57 |
| 4 | B-4 | 62 |
| 5 | B-5 | 61 |
| 6 | B-6 | 56 |
| 7 | B-7 | 60 |
| 8 | B-8 | 64 |

| | | |
|---|---|---|
| 9 | B-9 | 72 |
| 10 | B-10 | 66 |
| 11 | B-11 | 57 |
| 12 | B-12 | 55 |
| 13 | B-13 | 62 |
| 14 | B-14 | 66 |
| 15 | B-15 | 59 |
| 16 | B-16 | 58 |
| 17 | B-17 | 59 |
| 18 | B-18 | 64 |
| 19 | B-19 | 60 |
| 20 | B-20 | 64 |
| 21 | B-21 | 58 |
| 22 | B-22 | 64 |
| 23 | B-23 | 58 |
| 24 | B-24 | 60 |
| 25 | B-25 | 57 |
| 26 | B-26 | 63 |
| 27 | B-27 | 52 |
| 28 | B-28 | 58 |
| 29 | B-29 | 60 |
| 30 | B-30 | 59 |

In testing students' volleyball passing skills using the *scientific learning method*in the control class, the following results were obtained:

Table 4. List of Control Class *Posttest Scores*

| **No** | **Code** | ***Posttest*** |
|---|---|---|
| 1 | C-1 | 47 |
| 2 | C-2 | 48 |
| 3 | C-3 | 55 |
| 4 | C-4 | 49 |
| 5 | C-5 | 61 |
| 6 | C-6 | 49 |
| 7 | C-7 | 50 |
| 8 | C-8 | 55 |
| 9 | C-9 | 58 |
| 10 | C-10 | 60 |
| 11 | C-11 | 51 |
| 12 | C-12 | 58 |
| 13 | C-13 | 49 |
| 14 | C-14 | 52 |
| 15 | C-15 | 55 |

| | | |
|---|---|---|
| 16 | C-16 | 50 |
| 17 | C-17 | 54 |
| 18 | C-18 | 51 |
| 19 | C-19 | 55 |
| 20 | C-20 | 52 |
| 21 | C-21 | 60 |
| 22 | C-22 | 53 |
| 23 | C-23 | 58 |
| 24 | C-24 | 50 |
| 25 | C-25 | 62 |
| 26 | C-26 | 54 |
| 27 | C-27 | 53 |
| 28 | C-28 | 56 |
| 29 | C-29 | 55 |
| 30 | C-30 | 51 |

After the *posttest data in the experimental class and control class were collected, normality, homogeneity* and t-tests were carried out. The descriptive data of *the posttest results* students' volleyball passing skills in the table below.

Table 5. *Posttest Results Data* for Volleyball Passing Skills

| **Statistics** | | | |
|---|---|---|---|
| | | Experiment | Control |
| N | Valid | 30 | 30 |
| | Missing | 0 | 0 |
| Mean | | 60.43 | 53.70 |
| Median | | 60.00 | 53.50 |
| Mode | | 60 | 55 |
| Std. Deviation | | 3,928 | 4,087 |
| Range | | 20 | 15 |
| Minimum | | 52 | 47 |
| Maximum | | 72 | 62 |

Based on the table above, it can be seen that the highest posttest score *in the* experimental class is 72 and the control class is 6 2, while the lowest score for the experimental class is 52 and the control class is 47. The measure of central tendency which includes the class average (*mean*) for the experimental class is 60.43 and the control class is 53.70. The group variance size which includes the range or range for the experimental class is 20 and the control class is 15. The experimental class standard deviation is 3.928and the control class was 4,087. Before testing the hypothesis, the results of the final research value are first carried out by prerequisite tests, normality tests and data homogeneity tests. *Posttest* results from each class are used to test the normality of the data. The data normality

test in this study used the *Liliefors formula*, with a significance level of 5% which can be seen in the following table :

Table 6. Normality Test

| **Volleyball Passing Skills** | **Class** | **Sig.** |
|---|---|---|
| | Experiment | 0.115 |
| | Control | 0.200 |

The results of the Normality test for experimental class volleyball passing skills have a value of sig. 0.115 and the control class has a value of 0.200. So for each class > 0.05, which means H0 $_{is}$ accepted or both data are normally distributed. Meanwhile, the homogeneity test uses a two variance test which can be seen in the following table:

Table 7. Homogeneity Test

| | | | |
|---|---|---|---|
| **Volleyball Passing Skills** | *Based on mean* | Sig. | 0.536 |

From the homogeneity test results, students' volleyball passing skills with a significance level of 5% or 0.05 show that the homogeneity test results for the control class and experimental class were 0.536 >0.05. Thus it can be concluded that the variance of the two groups, the control class and the experimental class, with the data results being declared homogeneous. Based on the prerequisite tests for statistical analysis, it was found that the data on the results of the volleyball passing skills for both classes in this study were normally distributed and homogeneous. Therefore, hypothesis testing can be carried out using the t-test formula, namely independent *sample t-test* with a significance level (α) = 5% or 0.05, namely H $_0$ is rejected if the significant probability (sig) < 0.05 and vice versa H $_0$ is accepted if the significant probability (sig) is > 0.05 . After the data is collected, data analysis can be carried out which is used to test the hypothesis. Hypothesis testing uses the similarity of two averages; the statistical formula used is the t-test formula. The steps for testing the volleyball passing skill hypothesis are as follows:

Table 8. T-test results

| **Experiment and Control** | **Sig. (2-tailed)** | **t $_{count}$** | **t $_{table}$** |
|---|---|---|---|
| | 0,000 | 6,507 | 1,672 |

Based on the hypothesis test of the volleyball passing skills test, it can be seen that the obtained t $_=$ 6,507 > t $_{table}$ = 1,672 and the sig ( *2-tailed* ) value = 0,000 . Because sig.( *2-tailed* ) < α, namely 0.000 < 0.05, thus H $_0$ is rejected and H $_1$ is accepted. Therefore, it can be concluded that there is a difference in volleyball

passing skills between the control class using the *scientific learning method* and the experimental class using the learning method reciprocal.

This research was carried out at MIN 2 Bandar Lampung. The learning and research process is carried out face to face. The research began on November 20 to November 24 2023. The research was carried out over 4 meetings, and within a week it was carried out over 2 meetings in each class. In the experimental class it is Monday and Tuesday, for the control class it is Wednesday and Thursday. The instrument in this research is a subjective test of volleyball passing skills. The volleyball passing skills questions consist of 18 questions. The questions created have been validated and then tested and analyzed through validity tests and reliability tests, so that questions are obtained that are suitable for use. Hypothesis data collection was obtained from teaching volleyball passing skills in the experimental class and in the control class.

In the experimental class the first research was carried out on Monday, 2 2November 2023 using learning methods*reciprocally* to explain material and discuss i . Then explain the meaning of over and under volleyball passes. After explaining the material, the teacher invites students to discuss with their classmates about the volleyball passing process. The teacher gives question sheets to students' toanswered personally. The teacher asks students to collect answer sheets from questions that have been asked. Summing up the learning material, the teacher facilitates students in summarizing, directing and providing confirmation of the learning material that has been studied, and asking questions and providing responses regarding the discussion. Finally, students are given questions to work on.

The second or final meeting will be held on Tuesday, 2 3 November 2023. By using of *reciprocal learning method* to practice volleyball passing (*Posttest)*. The second meeting explained how to practice volleyball passing. After the process of explaining the material, the teacher invites students to form several groups, each group consisting of 2 people, where group members have different academic abilities. The teacher gives an example of how to pass volleyball well. Then one of the groups practiced passing a volleyball guided by the teacher. The other group assessed the volleyball passing skills.

After everyone gets a grade, the teacher provides directions and concludes the lesson they have learned. The first meeting in the control class on Wednesday, November 24 2023 uses the *scientific learning method*. The teacher explains the meaning of over and under passing in volleyball. Students are invited to record all the information regarding the volleyball passing material that the teacher has explained. The teacher gives several questions to expand the concept of the material that has been given. After completion, the teacher checks the results of the work that the students have done. The teacher invites students to ask questions regarding the meaning of volleyball passing that they do not yet understand.

The final control class meeting will be held on Friday, March 10 2023. At the final meeting the teacher will give a final test (*post-test*). However, before *the post-test* is given, the teacher gives students the opportunity to ask questions again about

all the material that was explained yesterday. After the students understand, the teacher gives practice on how to pass volleyball up and down correctly and well. After students try and practice, the teacher evaluates their volleyball passing skills (*post-test*). This aims to determine the students' volleyball passing skills.

After carrying out volleyball passing skills in the experimental class and control class, it can be concluded that there is a difference in the average value of volleyball passing skills with reciprocal learning and *scientific learning*. This is supported by the results of data analysis and test calculations that have been carried out. The normality test results were obtained which showed that the sample came from a normally distributed population. Because both data come from normally distributed data, they can be continued with homogeneity test analysis. Based on homogeneity analysis, it is known that the learning outcomes scores of experimental class and control class students have the same variance (homogeneous). Once it is known that the data comes from a normal population and the same population (homogeneous), the hypothesis test will then be carried out, namely using the t-test.

Based on the results of t-test calculations ( *independent sample t-test* ) which have been analyzed, it shows that the sig ( *2-tailed* ) < α value is 0.000 < 0.05, this means that at the significant level α = 0.05 $H_0$ is rejected and $H_1$ is accepted, so learning is reciprocal There is effectiveness of volleyball passing skills and the average volleyball passing skills of students in both groups, namely the experimental group and the control group, there are different classes, between reciprocal learning and *scientific learning* . Based on calculations carried out using the t-test, in tests between variants or subjects, it can be said that there is a difference in volleyball passing skills between classes given reciprocal learning *treatment* (experimental class) and classes given teacher-oriented approach *treatment ( teacher centered approach*) scientific approach (control class) .

Methods in the learning process are very important so that the learning process is more optimal. Using inappropriate learning methods causes students to have difficulty in learning PJOK skills, therefore using appropriate learning methods can require students to be creative and able to work together in groups so that students get maximum skills (Darmiyanti et al., 2020; Mile & Ruslan, 2021; Susila, 2022). The appropriate learning method to stimulate students to work together and be creative is the reciprocal method. The reciprocal learning method is based on the philosophy of constructivism which refers to several principles, namely knowledge is actively built by students themselves, the emphasis of the learning process is on the students, teaching is to help students, learning is emphasized on the process rather than the final result and the teacher acts as a facilitator and motivator (Puspita et al., 2017; Setianingsih et al., 2019; Siswanto & Purbangkara, 2019). The reciprocal model is a teaching style in which responsibility for providing feedback shifts from the teacher to peers. This role shift allows for increased social interaction between peers, and immediate feedback (Lardika, 2020). Reciprocal learning fosters patience with peers. The reciprocal method is a reciprocal learning model between teacher and student, student and

student (Sukama, 2018). The provider of information in learning is not only the teacher, but students can also play an important role in providing information. In student learning activities through the reciprocal method, students can improve and hone their speaking, thinking and collaborating skills so that the learning atmosphere is more effective.

The research that has been conducted has limitations, namely that the limited sample size can affect external validity, considering that the results from one class in one school cannot be generalized to a wider population. Additionally, inter individual variability in initial skill levels may influence research results, with reciprocal methods being more effective for some students than others. Control of external variables, such as students' physical condition, motivation, and learning environment, is also a challenge, because it is difficult to control all factors in a research setting. Subjectivity in assessing the skills and abilities of teachers or trainers in implementing reciprocal learning methods also influences the results. In addition, psychological factors such as students' self-confidence, anxiety, and interest in volleyball can influence the effectiveness of learning methods. Understanding these limitations is important to critically evaluate research results and consider steps to overcome limitations in future research.

## 4. Conclusions and Suggestions

Based on the results of t-test calculations *(independent sample t-test)* which have been analyzed, it shows that the sig ( *2-tailed* ) < α value is 0.000 < 0.05, meaning that at the significant level α = 0.05 $H_0$ is rejected and $H_1$ is accepted , then ball passing skills volleyball with the reciprocal learning method shows the effectiveness and average of volleyball passing skillsstudents in both groups, namely the experimental group and the control group, have different classes, between the reciprocal learning method and the scientific learning method. The reciprocal learning method is more effective than the *scientific learning method*.

Suggestions for future researchers are that expanding the sample size by involving more schools and classes from various regions will increase the generalization of research results. The use of a more comprehensive research design, such as *a pretest-posttest* control group, can also provide a clearer comparison between reciprocal learning methods and other methods. Additionally, extending the duration of the study would help see long-term changes in volleyball passing skills. Yet conducting subgroup analyzes based on variables such as gender, initial skill level, and socio-economic background could indicate whether this method is more effective for certain groups. By considering these suggestions and recommendations, future researchers can improve the quality and depth of their research, and make more meaningful contributions to the field of physical education and learning methods.

## 5. Author Contribution

The contribution of each author contains in writing the journal. DF Developed the research concept and design. SA collected data, and presented tables. WC prepares discussions, conclusions and abstracts.

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