



An Experimental Study on the Effects of Reciprocal and Inquiry Teaching Styles on Physical Education Students' Learning Outcomes for Butterfly Swimming Technique, FKIP UNCEN

Zainal Widyanto^{1*}, Andi Syaiful², Marsuki³, Heppy Hein Wainggai⁴

^{1,2,3,4} Physical Education, Health and Recreation, Universitas Cenderawasih, Indonesia

*Correspondent author: Zainal Widyanto, e-mail: zainal.widyanto@gmail.com

Received: 30 September 2023, Accepted: 9 October 2023, Published: 31 October 2023

Abstract

Objectives. This study investigates the effectiveness of Reciprocal and Inquiry teaching styles as alternative models to improve Butterfly swimming style learning.

Materials and Methods. The method used is experimental in this design the sample is obtained as large as the population size, and then an initial test or pre-test is held. The population in this study was 90 students. The sampling technique in this research used a purposive sampling technique, with a total sample of 30 people divided into two groups: the group with the reciprocal teaching method and the group with the inquiry method using matching with ordinal pairing.

Results. The research findings indicate that both reciprocal teaching style and inquiry teaching style positively impact the learning outcomes of butterfly swimming for students of UNCEN FKIP Penjaskesrek. The reciprocal teaching style achieved a t-count of 9.44 and a t-table of 2.201, while the inquiry teaching style had a t-count of 4.34 and a t-table of 2.201.

Conclusion. The reciprocal teaching style is more effective than other teaching styles in improving butterfly swimming learning outcomes for Physical Education students at FKIP UNCEN.

Keywords: Reciprocal Teaching Method, Inquiry Teaching Method, Butterfly Style Swimming

DOI: 10.35724/mjpes.v6i1.5570

©2023 Authors by Musamus University Merauke



Introduction

Sports organizations and government entities work together to develop athletic achievements. This means that each sport must focus on enhancing performance to make the nation proud, particularly in Papua, where one sport in particular - swimming - is prominent. To achieve this, sports associations are empowered to provide coaching, national and regional sports coaching centers are developed, and competitions are organized in stages and on an ongoing basis (Law Number 3 of 2005) (Firdaus 2011).

The Butterfly swimming style is a challenging and spectacular technique that requires a high level of skill and technical ability from the swimmer. Although the elegant movements of this swimming style create a beautiful image in the water, it is important to acknowledge the difficulty that lies behind it (Denay & Argantos, 2021). The Butterfly style used today is the

Butterfly swimming style with leg movements imitating the flick of a dolphin's tail, so it is called the Butterfly Dolphin Kick (Wicaksono et al, 2021). Butterfly swimming requires extraordinary strength, speed, and endurance due to its complex body coordination and synchronized arm and leg movements (Widiasih, 2023).

Various factors significantly affect the success of the learning process, such as the competency of the teacher, and the students, the availability of necessary facilities and infrastructure, and the learning methods employed, among others. In physical education, it is important to use multiple teaching methods to ensure effective learning Moston (1994:5) in (Saptono 2013) suggests that There are two main types of teaching methods: direct and indirect. Direct teaching methods are teacher-centered and consist of five types: reciprocal method, training method, command method, self-check method, and inclusion method. On the other hand, indirect teaching methods are student-centered and include guided discovery and discovery methods.

The reciprocal method is a teaching technique that encourages students to provide feedback to their peers. This approach places greater emphasis on student engagement in the learning process, with the teacher taking on a facilitator role to monitor and guide student activities. (Suminta et al., 2021). The responsibility for providing feedback shifts from the teacher to the student. This shift allows students to increase social interactions between their peers. As mentioned by Mosston (1994:65) in (Fazari, Hendrayana, and Juliantine 2020)"Reciprocal teaching methods are defined as a teaching style that shows social relationships between peers and conditions for providing fast feedback."(Amra 2016)The reciprocal method has the main characteristics of learning, including (1) Having the opportunity to repeat practice with individual observers; (2) Practicing tasks based on conditions provided with immediate feedback from peers; (3) being able to discuss with peers specific aspects of the assignment; (4) Seeing and understanding the parts and sequence in carrying out the task; and (5) Practicing assignments without the teacher asking for feedback or explanations when errors are corrected. The mechanism for implementing the reciprocal method according to Mosston (1994: 65) (Saptono 2013) is: (1) Providing opportunities during certain socialization processes to give and receive feedback from peers. (2) Observe the abilities of their partner's friends, compare, draw conclusions, and communicate the results with their partner's friends. (3) Learn how to give corrective feedback that does not disrupt the continuity of the friendship. (4) Develop patience, tolerance, and respect for the conditions for the successful implementation of the learning process. (5) Give rewards to those who are successful. (6) Developing social ties through carrying out tasks (Priyambada et al., 2016).

Inquiry is an extension of the discovery process that is used more deeply, meaning that the inquiry process contains mental processes at a higher level (Paramitha et al., 2016). The inquiry learning model can create meaningful learning because it develops cognitive, affective, and psychomotor aspects in a balanced way (Margunayasa, 2015). The inquiry learning model is a model that can encourage students to be active in learning (Betu, 2023). The inquiry teaching style was created by Suchman in 1962, with the reason of wanting to pay attention to helping investigate independently, but in an orderly way. He wants students to ask why an event occurred, obtain and process data logically, and for students to develop their intellectual strategies to get something new. Inquiry in English (inquiry) means to question, examine, and investigate. In simple terms, one of the learning styles in the field of science, which is still considered a fairly effective method, is the Inquiry teaching style. Inquiry learning is a strategy that emphasizes the process of seeking and discovering (Nainggolan, 2022).

A student's ability to master the butterfly technique can be influenced by differences in the intensity of the ability to master the subject matter between one student and another. This condition is not static but can change depending on internal and external factors. Student internal factors include talents, interests, level of intelligence, psychological and physical conditions (health), gender differences, motivation, and self-confidence. The level of self-confidence is very important in sports, especially aquatic sports because being confident will make it easier to carry out various new and well-planned methods (Sriningsih 2017). while external factors include the learning environment, learning methods applied, the teacher's ability to deliver learning material, facilities, and infrastructure.

After observing Penjaskesrek FKIP UNCEN students' performance in learning the Butterfly technique, it was found that many students are still struggling with the technique. The technique can be challenging for some students who struggle with coordinating their hand and leg movements. This causes them to face difficulty in maintaining a horizontal body position on the water's surface, leading to increased water resistance. Additionally, regulating their breathing while swimming can be a challenge, potentially affecting their swimming technique. One common problem is taking the hand style too deep or too shallow, which can reduce the efficiency of the movement. Judging from observations, by continuing to do things like this, it will be ensured that the students of Physical Education, Physical and Physical Sciences, FKIP UNCEN will not be able to swim the Butterfly Style properly and correctly. due to the wrong teaching style applied to FKIP UNCEN Physical Education students, especially butterfly swimming material. To overcome these problems, it is important to get guidance from lecturers, and experienced swimming coaches and to carry out appropriate technical exercises

consistently. With good practice, patience, and continuous correction, most technical problems in butterfly technique can be overcome.

To improve learning outcomes for the butterfly style, it is necessary to provide treatment by providing reciprocal and inquiry teaching styles as an alternative. In the context of the butterfly technique, a reciprocal teaching style can help students to better understand swimming techniques. They can observe each other and give feedback about hand, leg, or breathing movements. This allows them to understand technical aspects and correct each other's mistakes. Additionally, it promotes interpersonal communication and student engagement in learning.

In the butterfly technique, an inquiry teaching style can help students develop a deeper understanding of the principles of physics and swimming mechanics. They can understand why certain movements are necessary and how they affect the overall swimming style. This encourages students to think critically, find their solutions, and understand the basics of swimming technique. It also allows students to link theory with practice.

Based on the problems above, this research aims to determine the effectiveness of the reciprocal teaching method and the inquiry method on the butterfly swimming learning outcomes of FKIP UNCEN Penjaskesrek students.

Materials and methods

Research Participants

In this study, the population consists of 90 Physical Education students from FKIP UNCEN. To obtain a sample, random sampling techniques were used, resulting in a sample size of 30 individuals. The selected individuals are fourth-semester students who are taking the Swimming Learning course. The sampling technique used is random sampling. An ordinal pairing design is used to divide the sample into two groups, based on their test results, which are ranked from the highest to the lowest. The sample is then divided into Group A and Group B, and paired using the A-BAB formula. Group A was given reciprocal teaching style treatment, and Group B was given inquiry teaching style treatment.

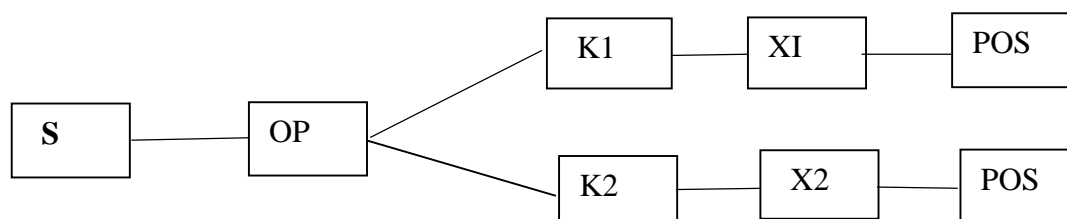


Figure 1. Two Group Pre-test and Post-test Design

Information:

S: Sample

Pre-test: Initial test of Butterfly Swimming Technique ability

OP: Ordinal Pairing

K1: Group 1

K2: Group 2

X1: Reciprocity Teaching Style

X2: Inquiry Teaching Style

Post-test: Final Test of Butterfly Swimming Technique Ability

The results of the tests carried out are then entered into the assessment norms which use a grouping formula using descriptive percentages.

Study organization

The research method used is the experimental method. This research design uses a pre-test and post-test group design were obtained as large as the population, then an initial test or pre-test is held. The initial test is carried out to determine the initial ability of the sample, in this case namely swimming ability. Next, treatment was given 8 times each for the reciprocal teaching style and the inquiry teaching style. With a reciprocal approach, students will learn from fellow students, while an inquiry approach will develop their abilities to pursue their knowledge. Both methods focus on student engagement and deeper understanding.

Statistical analysis

The initial test results is arranged based on *ranking*; the aim is to determine the swimming ability of the sample from the highest to the lowest. Next, they are divided into two, *and* then two objects with equal scores are matched using the *matching* method so that *the two groups have* the same butterfly swimming skills. Data analysis techniques use descriptive analysis, normality test, homogeneity test, and *t-test* using paired sample t-test and independent sample t-test with the help of the SPSS version 23.00 application.

Results

To get a general picture of the data of a study, descriptive data analysis is used on the data obtained. The following table provides the descriptive statistics for two teaching methods, Reciprocity Teaching (Group 1) and Inquiry Teaching (Group 2), based on the results of their initial and final tests. Each group had 30 participants. The table shows the sum, mean, standard deviation, variance, range, minimum, and maximum scores for each group.

Table 1. Top Service Ability

	Descriptive	Initial test	Final test
<i>Reciprocity</i>	N	30	30
<i>Teaching</i>	Sum	2540	2780
(Group 1)	Mean	127	136
	Std. Deviation	11.65	14.85

<i>Inquiry Teaching</i> (Group 2)	Variance	32.39	13.30
	Range	23	48
	Min	120	114
	Max	142	159
	N	30	30
	Sum	2390	2450
	Mean	122	126
	Std. Deviation	8.17	10.65
	Variance	134.80	114.00
	Range	38	35
	Min	109	114
	Max	145	152

The conclusions for the table above will be explained in more detail as follows:

- For the Post-test results data for the reciprocal teaching group, a total value (sum) of 2540 was obtained, the average value obtained (mean) was 127, with standard deviation results of 11.65 and a variance value of 32.39 from a data range of 23 between the minimum value of 120 and 142 for the maximum value.
- For the Post-test results data for the Reciprocal teaching group, a total value (sum) of 2780 was obtained, the average value obtained (mean) was 136, with standard deviation results of 14.85 and a variance value of 13.30 from a data range of 48 between the minimum value of 114 and 159 for the maximum value.
- For the Pre-test results data for the Inquiry teaching group, a total value (sum) of 2390 was obtained, and the average value obtained (mean) was 122, with standard deviation results of 8.17 and a variance value of 134.80 from a data range of 38 between a minimum value of 109 and 145 for the maximum value.
- For the Post-test results data for the Inquiry teaching group, a total value (sum) of 2450 was obtained, the average value obtained (mean) was 126, with standard deviation results of 8.17 and a variance value of 114.00 from a data range of 35 between the minimum value of 114 and 152 for the maximum value.

The results of testing the normality of research variable data can be seen in the following table:

Table 2. Normality Test

No	Court Ability		Sig value	α	Note
1	Reciprocity Teaching	Pre-test	0.913	0.05	Normal
	Inquiry Teaching		0.642	0.05	Normal
2	Reciprocity Teaching	Post-test	0.989	0.05	Normal
	Inquiry Teaching		0.933	0.05	Normal

- a. In testing the normality of reciprocal teaching in the Pre-test, a significant level value of $0.913 > \text{the value of } 0.05$. Thus, the reciprocal teaching group in the Pre-test obtained follows a normal distribution or normal distribution.
- b. In testing the normality of Inquiry teaching in the Pre-test, a significant level value of $0.642 > \text{than the value of } 0.05$. Thus, the group teaching inquiry on the Pre-test obtained follows a normal distribution or normal distribution.
- c. In testing the normality of reciprocal teaching in the Post-test, a significant level value of $0.989 > \text{the value of } 0.055$. Thus, the reciprocal teaching group in the Post-test obtained follows a normal distribution or normal distribution
- d. In testing the normality of inquiry teaching in the Post-test, a significant level value of $0.933 > \text{the value of } 0.055$. In this way, the group teaching Inquiry on the Post-test obtained follows a normal distribution or normal distribution.

This homogeneity test is required to test samples from a homogeneous population.

Table 3. Summary of Variable Data Homogeneity Test

Top serviceability	Levene Statistics	Df 1	Df 2	Sig
<i>Pre-test</i> teaching group	1,836	30	30	0.146

Based on Table 3, the homogeneity test of the Pre-test data with the Levene test is 1.836 with a significant value of 0.146. Because the probability value $> \alpha 0.05$ or a significance level of 95%, the Pre-test for the reciprocal teaching group and the inquiry teaching group for both teaching groups is homogeneous or comes from the same group. The second requirement, namely the homogeneous test, shows that the Pre-test and Post-test of the reciprocal teaching group and the inquiry teaching group are homogeneous or belong to the same group. The group data results above show a general picture of the data obtained from actual research results.

Table 4.T-Test Summary

Data	tcount	ttable	Note
Pre-test and Post-test reciprocal teaching	9.44	2,201	Sig
Pre-test and Post-test inquiry teaching	4.34	2,201	Sig

The table shown that reciprocal teaching obtained a t-count of 9.44 and a t-table of 2.201. Meanwhile, teaching inquiry obtained a t-count of 4.34 and a t-table of 2.201. So, it can be concluded that the reciprocal teaching group can improve more than Inquiry teaching on butterfly swimming ability.

Discussion

The data analysis results indicate that the reciprocal and inquiry teaching methods have an impact on butterfly swimming ability, based on theoretical studies and statistical calculations. According to the research, the reciprocal teaching style is more effective than inquiry when it comes to learning butterfly swimming for Penjaskesrek students at FKIP UNCEN. This finding is significant for developing teaching methods. Reciprocal teaching methods have unique characteristics that make them more appropriate for certain learning contexts than inquiry-based methods. Effective teaching styles can vary depending on the abilities and interests of students. While some students may respond better to reciprocity, others may prefer inquiry. The reciprocal teaching style provides more structured technical instruction, which is particularly important when learning specific swimming techniques like the butterfly style. In this situation,

These findings are supported by previous research that is relevant to this research. Research results (Isa, 2020) conducted on class VII students at SMP Negeri 2 Cilegon that there was an influence of Reciprocal Teaching Style and Inquiry Teaching Style on the results of learning breaststyle swimming in students, after the two styles were given to students, and the results obtained from data analysis were teaching styles Reciprocal is better, compared to the Inquiry teaching style. Added research results(Shaleh et al., 2019) said that there was an increase in student learning outcomes through a reciprocal teaching style in freestyle swimming courses for students of the Bina Guna College of Sports and Health (STOK) Physical Education and Recreation Study Program class B in 2018/2019. By implementing the reciprocal teaching style that the researchers have designed, namely using pairs and assistive media in the form of pull boys and floats according to student needs to improve freestyle swimming learning outcomes, students are more active in participating in the learning process so that optimal results can be obtained in mastering the material. lectures, especially freestyle swimming.

Based on the research findings, lecturers can improve their students' learning outcomes by applying both reciprocal and inquiry teaching styles. A combination of various teaching methods can be the most effective approach to teaching butterfly swimming to Physical Education students at FKIP UNCEN. A lecturer typically begins by delivering structured technical instructions to familiarize students with the basic techniques of the butterfly technique. After that, the lecturer integrates inquiry-based elements to help students understand these basic swimming principles in more depth. It's essential to be flexible in your teaching approach and prioritize student success and comprehension. The safety of students and teaching proper swimming techniques is of utmost importance, and teaching methods must be adapted

accordingly. It is recommended that lecturers choose an effective teaching style that supports butterfly swimming learning outcomes. A good teaching program has a teaching method which is right on target, so that to improve butterfly swimming ability, several types of teaching methods can be used such as reciprocal and inquiry teaching methods.

Training has three main tasks: exploring, organizing, and developing training and training concepts by combining practical and scientific approaches. This helps ensure that the process is efficient and effective. Two methods that can be used for training are centralized and random training. The reciprocal style of training is characterized by a direct and immediate relationship between the teacher's stimulus and the student's response. The teacher's stimulus precedes every movement of students who carry out their movement tasks according to the commands or model examples given by the teacher. Location decisions (where the task is performed), posture, starting time, speed and rhythm, stopping time, length of the task, and intervals are all made by the teacher.

Conclusion

According to the research findings, both the reciprocal teaching style and the inquiry teaching style have a positive impact on improving the butterfly swimming skills of Physical Education students at FKIP UNCEN. The reciprocal teaching style was found to be more effective in improving the learning outcomes with a t-count of 9.44, compared to the inquiry teaching style which obtained a t-count of 4.34. The results suggest that the reciprocal teaching style is a better approach for Physical Education students at FKIP UNCEN to improve their butterfly swimming skills.

References

- Amra, Qalbi. 2016. "Hubungangaya Reciprocal , Gaya Inclusion Dan Motivasi Berlatih Terhadap Keterampilan Sepakbola Pemain SSB Muspan FC Kota Padang." *Jurnal Menssana* 1(1):16–27.
- Betu, F. S. (2023). Strategi Pembelajaran Inkuiri Sebagai Tawaran Dalam Proses Belajar Mengajar Yang Efektif (Tinjauan Kurikulum Dan Pembelajaran). *Atma Reksa Jurnal Pastoral Dan Kateketik*, 7(2), 15. <https://doi.org/10.53949/jar.v7i2.154>
- Denay, N., & Argantos. (2021). Keterampilan Renang Gaya Kupu-kupu Mahasiswa Departemen Kepelatihan Naluri. *Jurnal Patriot*, 3(March), 71–81. <https://doi.org/10.24036/patriot>.
- Fazari, Imam, Yudy Hendrayana, and Tite Juliantine. 2020. "Analisis Resiprocal Teaching Style Dan Self Check Style Terhadap Hasil Belajar Dengan Menggunakan Systematic Literature Review." *Jurnal Penelitian Pendidikan* 20(3):445–50. doi: 10.17509/jpp.v20i3.30793.
- Firdaus, Kamal. 2011. "Evaluasi Program Pembinaan Olahraga Tenis Lapangan Di Kota Padang." *Jurnal Media Ilmu Keolahragaan Indonesia* 1(2):127–32.

- Isa, M. (2020). Comparative Teaching Of Reciprocal From With Teaching Of Inkuiri From With Teaching Of Inkuiri From Towards The Result Of Study Chest Swimming Form. July, 1–23.
- Margunayasa, I. G. (2015). Dan Gaya Kognitif Terhadap Keterampilan Proses Sains Dan Hasil Belajar IPA Dengan Mengontrol Motivasi Berprestasi Pada Siswa Kelas V SD Di Kota Singaraja. *Proceddings Seminar Nasional FMIPA UNDIKSHA V*, 124–129.
- Maglischo, E. W. (2003). Swimming fastest. *Human Kinetics*.
- Nainggolan, E. N. (2022). *Pengaruhmodel Pembelajaran Inkuiri Berbasis Kolaboratif Terhadap Hasil Belajar Siswa Pada Materi Gaya Dikelas Ivdsdn165735 Kota Tebing Tinggi*.
- Paramitha, I. D. A. A., Sulastri, M., & Margunayasa, I. G. (2016). Pengaruh Model Inkuiri Terbimbing, Gaya Kognitif, Dan Motivasi Berprestasi Terhadap Pemahaman Konsep Ipa Siswa Kelas V SD. *Jurnal Pendidikan Dan Pengajaran*, 49(2), 80. <https://doi.org/10.23887/jppundiksha.v49i2.9012>
- Priyambada, G., Ks, S., & Handayani, O. W. K. (2016). Pengaruh Gaya Mengajar Resiprokal Dan Motivasi Berprestasi Terhadap Hasil Pembelajaran Senam Lantai. *Journal Of Physical Education And Sport*, 5(1), 1–7.
- Quthni, A., Tarigan, H., & Sitepu, A. (2018). Pengaruh Gaya Mengajar Resiprokal dan Inkuiri Terhadap Hasil Belajar. *Pendidikan Jasmani Kesehatan Dan Rekreasi FKIP UNILA*, 1, 1–7.
- Rusli Lutan. (1988). Belajar Keterampilan Motorik: Pengantar Teori dan Metode. Jakarta: Dirjen Dikti-Depdikbud.
- Saptono. 2013. “Perbedaan Pengaruh Metode Mengajar Reciprocal Dan Self Check Terhadap Peningkatan Keterampilan Teknik Dasar Bolavoli.” *Jurnal Pendidikan Jasmani Indonesia* 7(2):111–16.
- Sriningsih, 2017. 2017. “Jurnal Pendidikan Jasmani Dan Olahraga Volume 2 Nomor 2. September 2017.” 2(September):43–52.
- Suminta, I., Nugroho, S., Afrinaldy, R., & Izzuddin., deden akbar. (2021). Pengaruh Gaya Mengajar Resiprokal Terhadap Gerak Dasar (Shooting) Pada Ekstrakurikuler Sepakbola di SMP Negeri 1 Rengasdengklok. *Jurnal Literasi ...*, 2(April), 151–155. <https://journal.unsika.ac.id/index.php/JLO/article/view/5333%0Ahttps://journal.unsika.ac.id/index.php/JLO/article/download/5333/2905>.
- Syaleh, M., Lubis, A. E., & Helmi, B. (2019). Kontribusi Gaya Mengajar Resiprokal Terhadap Hasil Belajar Renang Gaya Bebas. *Jurnal Ilmiah STOK Bina Guna Medan*, 7(1), 30–39. <https://doi.org/10.55081/jsbg.v7i1.11>
- Wicaksono, G. H., Purnama, Y., & Winasto, P. E. (2021). Pengembangan alat bantu berenang flying swimming untuk pembelajaran renang pemula. *SPRINTER: Jurnal Ilmu Olahraga*, 2(1), 152–156.

Widiasih, K. (2023). Upaya meningkatkan kemampuan berenang gaya dada melalui teknik latihan terbimbing pada siswa kelas IX C di MTS Negeri 1 Purbalingga. *Learning: Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, 3(1), 20– 25.

Information about the authors:

Zainal Widyanto: zainal.widyanto@gmail.com, Physical Education, Health and Recreation, Universitas Cenderawasih, Indonesia.

Andi Syaiful: andisyaiful609@gmail.com, Physical Education, Health and Recreation, Universitas Cenderawasih, Indonesia.

Marsuki: marsukidkd@gmail.com, Physical Education, Health and Recreation, Universitas Cenderawasih, Indonesia.

Heppy Hein Wainggai :heppywainggai@gmail.com, Physical Education, Health and Recreation, Universitas Cenderawasih, Indonesia.

Cite this article as: Zainal Widyanto, et al. An Experimental Study on the Effects of Reciprocal and Inquiry Teaching Styles on Physical Education Students' Learning Outcomes for Butterfly Swimming Technique, FKIP UNCEN. *Musamus Journal of Physical Education and Sport (MJPES)*, Volume 6, No 1, 2023, 41-51, <https://doi.org/10.35724/mjpes.v6i1.5570>.