



Exploring the long-term retention of badminton skills: a comparison between command and reciprocal teaching styles

Exploración de la retención a largo plazo de las habilidades en bádminton: comparación entre los estilos de enseñanza por comandos y recíprocos

Authors

Dwi Lorry Juniarisca ¹
 Adhega Wijaya ¹
 Aprilyan Putra Bimantoro ¹
 Shidqi Hamdi Pratama Putera ¹
 Dewangga Yudhistira ¹
 La Ode Adhi Virama ²
 Yudi Dwi Saputra ¹

¹ Universitas Negeri Surabaya,
 Surabaya, Indonesia
² Institut Agama Islam Negeri
 Kendari

Corresponding author:
 Dwi Lorry Juniarisca
 dwijuniarisca@unesa.ac.id

Received: 20-10-25
 Accepted: 01-12-25

How to cite in APA

Juniarisca, D. L., Wijaya, A., Bimantoro, A. P., Pratama Putera, S. H., Yudhistira, D., & Virama, L. O. A. (2026). Exploring the long-term retention of badminton skills: a comparison between command and reciprocal teaching styles. *Retos*, 74, 891-900. <https://doi.org/10.47197/retos.v74.117922>

Abstract

Objective: This study compared the effectiveness of Command and Reciprocal teaching styles on learning outcomes and long-term retention of the low backhand serve skill in badminton among high school students.

Materials and Methods: A 2×3 experimental factorial design was conducted with sixty tenth-grade students aged 15–16 years, randomly assigned to Command or Reciprocal groups. The intervention lasted six weeks with three 60-minute sessions per week, and performance was assessed using pre-test, post-test, and retention tests measuring serve accuracy, technique execution, and learning perceptions.

Results: The Reciprocal group showed significantly higher serve accuracy, better skill retention, and a large effect size compared with the Command group. Strong positive correlations were found between technique execution and serve accuracy, and higher levels of satisfaction, self-confidence, and motivation were reported by students in the Reciprocal group.

Conclusion: The Reciprocal teaching style was more effective than the Command style in improving learning and long-term retention of the badminton low backhand serve, highlighting its value for physical education instruction.

Keywords

Badminton, teaching style, respirocal, command.

Resumen

Objetivo: Este estudio comparó la eficacia de los estilos de enseñanza «mandatorio» y «recíproco» en los resultados del aprendizaje y la retención a largo plazo de la habilidad del servicio de revés bajo en bádminton entre estudiantes de secundaria.

Materiales y métodos: Se llevó a cabo un diseño factorial experimental 2×3 con sesenta estudiantes de décimo grado de entre 15 y 16 años, asignados aleatoriamente a grupos «mandatorios» o «recíprocos». La intervención duró seis semanas, con tres sesiones de 60 minutos por semana, y el rendimiento se evaluó mediante pruebas previas, posteriores y de retención que medían la precisión del servicio, la ejecución de la técnica y las percepciones del aprendizaje.

Resultados: El grupo recíproco mostró una precisión del servicio significativamente mayor, una mejor retención de la habilidad y un mayor efecto en comparación con el grupo de mando. Se encontraron fuertes correlaciones positivas entre la ejecución de la técnica y la precisión del servicio, y los estudiantes del grupo «Reciprocal» informaron de mayores niveles de satisfacción, confianza en sí mismos y motivación.

Conclusión: El estilo de enseñanza «Reciprocal» fue más eficaz que el estilo «Command» para mejorar el aprendizaje y la retención a largo plazo del servicio de revés bajo en bádminton, lo que destaca su valor para la enseñanza de la educación física.

Palabras clave

Bádminton, estilo de enseñanza, recíproco, comando.

Introduction

Physical education is a branch of study that goes beyond cognitive objectives in the learning process (Maliki, Suherman, Prasetyo, Dwi Pradipta, et al., 2025). Today, the teaching process is based on how competent teachers manage the educational experience using instructional approaches. Teachers can make their lessons more interactive, harmonious, and aligned with their students' preferences, proclivities, and interests (Al-Jaafreh & Almaaitah, 2023).

Teaching strategies are intimately tied to the curriculum's objectives and content (Cenoz, 2015). The chosen teaching approach must be consistent with the long- and short-term objectives (Santoso, Pambudi, Prayadi, Utami, & Yudhistira, 2024). These methods also differ depending on the material being taught. Theoretical subjects in physical education demand distinct teaching methods from practical subjects (Adhi Virama, Karim, & Dalman, 2023; Maliki, Suherman, Prasetyo, Pradipta, et al., 2025; Raehang, Virama, & Yudhistira, 2025). However, certain qualities and procedures are required for any approach to be regarded as effective. Thus, the optimal teaching approach produces the desired results (Al-Sharifi & Al-Zubaidi, 2006).

The Command Style is a popular teaching approach in physical education (Byra, Sanchez, & Wallhead, 2014; Cuellar-Moreno, 2016). This style is considered Muska Mosston's original teaching method. This style is based on commands, in which the teacher directs students on what is thought appropriate for the lesson. In this approach, the teacher takes the lead role, and student activities must be prompted by the teacher's cues. This technique requires the teacher to fulfill all three roles: planning, execution, and assessment. Furthermore, the teacher makes all decisions, including those regarding location, position, time, start, end, rhythm, and rest (Cohn, 2016).

On the other hand, the Reciprocal Style is regarded as a direct method that involves students in decision-making throughout the learning process (Carey, Simonton, & Byra, 2023; Chatoupis & Vagenas, 2018). Learners get more involved and active in assessment decisions by providing feedback to peers who practice the skill. Learners observe, correct, and discuss their performance. The roles are then reversed, with the observer becoming the actor and the actor becoming the observer. This results in a reciprocal interaction in which the observer and player switch roles (Al-Jaafreh & Almaaitah, 2023).

Badminton is regarded as a sport in its early stages of development and has been widely popularized (Ardha et al., 2024). This makes knowing effective teaching methods for developing essential abilities in this game critical. Given the availability of numerous teaching methods, each with its own set of objectives and features, these methods contribute to error correction and management while also having the potential to accelerate the learning process. Thus, understanding these methods and determining the optimal approach to teaching skills helps promote success and development in this sport (Aelterman et al., 2019; Bartholomew et al., 2018).

Serving in badminton is a fundamental skill and is considered key to playing and excelling in competition (Ihsan, Nasrulloh, & Nugroho, 2024). The short serve, in particular, is widely used in the game, beginning each exchange of shots. This serve uses the backhand to position the shuttlecock in a way that makes it difficult for the opponent to return it with strength or score immediately (Capel, Lawrence, Martens, & Rahman, 2022).

The short backhand serve is an important strategic tool in badminton. A good serve can give you an advantage from the outset of a rally, so mastering this technique is essential (Edmizal, Rahman, Barlian, Donie, & Alnedral, 2024). A study of over 200 professional and amateur matches discovered that 59% of rallies were completed in the first four shots, with many of these being service errors (Jo, 2025).

When properly executed, the low backhand serve prevents the opponent from hitting an offensive shot.

This serve causes the shuttlecock to fly just over the net, making it difficult for the opponent to advance and smash down (Aslam, Bashir, Draz, & Raja, 2019). This technique takes good control and regular practice to perfect, especially given its technical and delicate nature, where even minor adjustments can have a huge impact on future shots in a rally.

The teaching method is quite important for learning the low backhand serve skill. The command and reciprocal styles each have distinct characteristics that can influence the success of this talent. The command method, with its direct approach and unambiguous directions from the teacher, provides a



framework for beginners to acquire the principles of the technique (Hewitt, 2015). On the other hand, the reciprocal method, which emphasizes student involvement and feedback, might provide a unique viewpoint on the learning process (Hewitt, 2015).

The research challenge emerged from the researchers' experiences as instructors for a sports course at the Faculty of Sport Science. They observed a common usage of the command style in teaching the skill during practical sessions, with the instructor taking full responsibility for all parts of the lesson. Given the unique nature of badminton and its reliance on partner assistance during skill execution, researchers recognized the importance of investigating the Reciprocal style, which may be better suited for learning the low backhand serve skill than the currently popular Command style (Al-Jaafreh & Almaaitah, 2023).

The primary reason for doing this research was to better understand the efficiency of various training approaches for the low backhand serve skill in badminton. The purpose of this study was to look into how applying the Command and Reciprocal styles affected the accuracy of badminton's low backhand serve skill. The results are expected to provide valuable insights for physical educators and badminton coaches regarding the most effective teaching methods for developing this skill in students.

Thus, this study will make significant contributions to the field of physical education, particularly badminton instruction. With a greater understanding of effective teaching methods, improved instructional programs can be devised to improve students' learning and performance in the low backhand serve skill, therefore enhancing their overall badminton playing skills.

Method

Study Participants

This study included 60 10th-grade students from SMA Negeri X (aged 15-16) chosen through a purposive sample technique. Inclusion criteria included the following: (1) students had no formal experience playing badminton, (2) had never participated in badminton training outside of school, (3) had no physical injuries that would prevent full participation in the training program, and (4) were willing to participate throughout the study. The study subjects included 30 male and 30 female students who were randomly assigned to two experimental groups with equal numbers of members: a command style group (n=30) and a reciprocal style group (n=30).

Study Organization

Research Design

This study employed an experimental method with a 2x3 factorial design (two teaching method groups x three measurement periods). The independent variable was the teaching method (command and reciprocal style), while the dependent variable was the accuracy of the low backhand serve in badminton. Measurements were taken at three different time points: a pre-test (before the program), a post-test (immediately after the program), and a retention test (four weeks after the program's completion) to assess long-term skill retention.

Research Instrument

1. **Low Backhand Serve Accuracy Test.** This test was designed to assess the accuracy of the low backhand serve in badminton. The receiving court area was divided into five scoring zones of varying difficulty (5, 4, 3, 2, and 1 points). Zone 5 (the highest-scoring area) was situated directly behind the short service line and near the center line, giving it a great target for a low backhand serve. Each participant attempted 12 serves, and the 10 best attempts were summed to determine the final score.
2. **Service Technique Assessment Rubric.** The low backhand serve technique is assessed using an observation rubric that includes five technical components: (1) starting position, (2) racket grip, (3) contact with the shuttlecock, (4) follow-through movement, and (5) finishing position. Each component is rated from 1 to 5 depending on certain criteria, with a maximum total score of 25 points.



3. Student Perception Questionnaire. This questionnaire consists of 15 items using a 5-point Likert scale to measure students' perceptions of teaching methods, self-confidence levels, and learning motivation. The questionnaire was administered after the teaching program was completed (post-test) and during the retention test.

Research Procedures

This study was carried out over 10 weeks on a structured schedule. During the first week, participants were given an orientation and a pre-test to assess low backhand serve accuracy, as well as demographic data and sports experience. Weeks two through seven consisted of a six-week learning program in which both groups received low backhand serve learning materials of the same duration and content, delivered in three 60-minute sessions per week (Monday, Wednesday, Friday) that included a 10-minute warm-up, a 40-minute main section, and a 10-minute cool-down. In the command style group, the teacher explained and demonstrated the technique, supervised the students, and provided immediate corrective feedback. Meanwhile, in the reciprocal style group, students worked in pairs, one as the performer and the other as the observer, with the observer providing feedback on a worksheet provided by the teacher. After five attempts, students switched roles, with the teacher providing support as needed. In the eighth week, a post-test was administered, which included measuring low backhand serve accuracy, filling out a student perception questionnaire, and grading the technique using an assessment tool. Weeks nine through twelve were non-practice weeks, during which individuals got no badminton instruction or practice and were not permitted to perform low backhand serves independently. In week thirteen, a retention test was used to assess low backhand serve skill retention, students filled out a questionnaire about their perceptions, and technique was rated using a scoring system. To ensure internal validity, this study controlled for several variables, including the same duration and frequency of learning for both groups, identical learning materials, sessions held at the same time, instruction provided by the same teacher, and all participants using the same equipment.

Statistical Analysis

The data in this study were analyzed using SPSS software version 26.0 at a significant level of p-value of <0.05 . Several methods were utilized in the statistical analysis, including descriptive statistics such as the mean, standard deviation, minimum value, and maximum value for all dependent variables at three measurement times (pre-test, post-test, and retention test). A mixed ANOVA analysis was used to test the interaction effect of teaching method (as a between-subject factor) and measurement time (as a within-subject factor) on low backhand serve accuracy scores, followed by Mauchly's test to test the sphericity assumption and Greenhouse-Geisser correction if needed. Furthermore, a One-way Repeated Measures ANOVA was performed to assess the change in scores in each group (command style and reciprocal style) at the three measurement time points, with a Bonferroni post-hoc test for pairwise comparisons. Independent Samples t-tests were used to compare mean scores between the two groups at each measurement time (pre-test, post-test, retention test), while Paired Samples t-tests were used to examine differences between the post-test and retention test within each group, indicating the level of skill retention. Cohen's d was used to quantify the effect size of the observed differences, and Pearson Correlation was utilized to examine the correlations between technique scores and service accuracy scores, as well as between student perceptions and retention test performance. To analyze student perception scores from the questionnaire, the Mann-Whitney U test was used to compare differences between the command and reciprocal style groups, and the Wilcoxon signed-rank test was used to analyze changes in perception from the post-test to the retention test within each group. All analyses were tested to ensure that they met fundamental assumptions such as normality (using the Shapiro-Wilk test), variance homogeneity (using Levene's test), and sphericity. If these assumptions were not met, data transformation or non-parametric alternatives were applied.

Results

Participant Characteristics



Participant demographic and baseline characteristics are presented in Table 1. The randomization process resulted in comparable groups with no significant differences in age, height, weight, or prior general physical activity levels ($p > 0.05$).

Table 1. Characteristics of Participants by Teaching Style Group (Mean \pm SD)

| Characteristics | Command Style (n=30) | Reciprocal Style (n=30) | p-value |
|--------------------------|----------------------|-------------------------|---------|
| Age (years) | 15.47 \pm 0.51 | 15.53 \pm 0.51 | 0.634 |
| Height (cm) | 163.27 \pm 8.36 | 164.13 \pm 7.89 | 0.677 |
| Weight (kg) | 55.83 \pm 7.42 | 54.97 \pm 7.95 | 0.666 |
| Gender (M/F) | 15/15 | 15/15 | 1.000 |
| Physical Activity Index* | 2.37 \pm 0.72 | 2.43 \pm 0.68 | 0.724 |

* Physical Activity Index: 1 = inactive, 2 = slightly active, 3 = moderately active, 4 = very active

Low Backhand Serve Accuracy Test Results

Descriptive statistics for accuracy test scores in the pre-test, post-test, and retention test are presented in Table 2.

Table 2. Descriptive Statistics for Service Accuracy Scores by Teaching Style and Time (Mean \pm SD)

| Measurement Time | Command Style (n=30) | Reciprocal Style (n=30) | P-value | Effect Size (Cohen's d) |
|---------------------------------|----------------------|-------------------------|----------|-------------------------|
| Pre-test | 14.83 \pm 3.24 | 15.07 \pm 3.41 | 0.782 | 0.07 |
| Post-test | 29.47 \pm 5.17 | 34.80 \pm 4.75 | < 0.001* | 1.08 |
| Retention test (4 weeks) | 25.27 \pm 4.86 | 32.13 \pm 4.32 | < 0.001* | 1.49 |
| Post-test decrease in retention | 4.20 \pm 1.97 | 2.67 \pm 1.58 | 0.001* | 0.85 |
| Retention Percentage** | 85.75% \pm 5.30% | 92.33% \pm 4.18% | < 0.001* | 1.38 |

* Statistically significant difference ($p < 0.05$)

** Retention Percentage = (Retention test score / Post-test score) \times 100%

Mixed ANOVA Results

A 2×3 mixed ANOVA was conducted to test the effects of teaching style (command vs. reciprocal) and time (pre-test, post-test, retention test) on service accuracy scores. The Mauchly test showed that the sphericity assumption was met ($\chi^2(2) = 4.76, p = 0.093$).

Table 3. Mixed ANOVA Results for Service Accuracy Scores

| Source | df | F | p-value | Partial η^2 |
|------------------------------|--------|--------|----------|------------------|
| Time | 2. 116 | 454.93 | < 0.001* | 0.887 |
| Teaching style | 1. 58 | 17.83 | < 0.001* | 0.235 |
| Time \times Teaching Style | 2. 116 | 23.17 | < 0.001* | 0.286 |

* Statistically significant at $p < 0,05$

The analysis revealed significant main effects for time ($F(2, 116) = 454.93, p < 0.001, \text{partial } \eta^2 = 0.887$) and teaching style ($F(1, 58) = 17.83, p < 0.001, \text{partial } \eta^2 = 0.235$). More importantly, there was a significant interaction effect between time and teaching style ($F(2, 116) = 23.17, p < 0.001, \text{partial } \eta^2 = 0.286$), indicating that the pattern of change in service accuracy scores over time differed between the two teaching style groups.

Within-Group Analysis

To further test the effect of time within each teaching style group, one-way repeated measures ANOVA analysis was conducted separately for each group.

Table 4. One-way Repeated Measures ANOVA Results based on Teaching Style Group

| Group | Source | df | F | p-value | Partial η^2 |
|------------------|--------|-------|--------|----------|------------------|
| Command Style | Time | 2. 58 | 163.24 | < 0.001* | 0.849 |
| Reciprocal Style | Time | 2. 58 | 321.67 | < 0.001* | 0.917 |

* Statistically significant at $p < 0.05$

Command Style Group

For the command style group, a one-way repeated measures ANOVA revealed a significant effect of time ($F(2, 58) = 163.24, p < 0.001, \text{partial } \eta^2 = 0.849$). Post-hoc comparisons using Bonferroni correction revealed a significant increase from pre-test ($M = 14.83, SD = 3.24$) to post-test ($M = 29.47, SD = 5.17, p < 0.001$), a significant decrease from post-test to retention test ($M = 25.27, SD = 4.86, p < 0.001$), and a significant overall increase from pre-test to retention test ($p < 0.001$).

Reciprocal Style Group

A one-way repeated measures ANOVA in the reciprocal style group revealed a significant effect of time ($F(2, 58) = 321.67, p < 0.001, \text{partial } \eta^2 = 0.917$). Post-hoc comparisons using Bonferroni correction showed a significant increase from pre-test ($M = 15.07, SD = 3.41$) to post-test ($M = 34.80, SD = 4.75, p < 0.001$), a significant decrease from post-test to retention test ($M = 32.13, SD = 4.32, p < 0.001$), and a significant overall increase from pre-test to retention test ($p < 0.001$).

Intergroup Comparison

An independent samples t-test was used to compare serve accuracy scores between the two teaching style groups at each time point. At pre-test, there was no significant difference in serve accuracy scores between the command style group ($M = 14.83, SD = 3.24$) and the reciprocal style group ($M = 15.07, SD = 3.41$), $t(58) = -0.278, p = 0.782, d = 0.07$, showing that both groups began at comparable skill levels. At post-test, the reciprocal style group ($M = 34.80, SD = 4.75$) scored significantly higher than the command style group ($M = 29.47, SD = 5.17$), $t(58) = -4.178, p < 0.001, d = 1.08$, indicating that the reciprocal style was more effective in developing serve accuracy immediately after the intervention. In the retention test, the reciprocal style group ($M = 32.13, SD = 4.32$) continued to show significantly higher service accuracy scores than the command style group ($M = 25.27, SD = 4.86$), $t(58) = -5.809, p < 0.001, d = 1.49$, indicating better long-term skill retention.

Skill Retention Analysis

Skill retention was analyzed by comparing the percentage of skills retained from the post-test to the retention test, as well as the absolute decrease in scores. The reciprocal style group demonstrated significantly better skill retention ($92.33\% \pm 4.18\%$) than the command style group ($85.75\% \pm 5.30\%$), $t(58) = -5.365, p < 0.001, d = 1.38$. The absolute decrease in scores from post-test to retention test was significantly smaller in the reciprocal style group (2.67 ± 1.58 points) than in the command style group (4.20 ± 1.97 points), $t(58) = 3.383, p = 0.001, d = 0.85$.

Technique Evaluation Results

The low backhand serve technique was evaluated on a 25-point rubric based on five components (starting position, racket grip, contact with the shuttlecock, follow-through movement, and ending position).

Table 5. Technique Implementation Scores based on Teaching Style and Time (Mean \pm SD)

| Measurement Time | Command Style (n=30) | Reciprocal Style (n=30) | p-value | Effect Size (Cohen's d) |
|---------------------------------|----------------------|-------------------------|----------|-------------------------|
| Pre-test | 8.73 \pm 1.89 | 8.87 \pm 1.96 | 0.787 | 0.07 |
| Post-test | 18.50 \pm 2.82 | 21.37 \pm 2.11 | < 0.001* | 1.14 |
| Retention test (4 weeks) | 16.23 \pm 2.47 | 19.60 \pm 2.04 | < 0.001* | 1.48 |
| Post-test Decrease in Retention | 2.27 \pm 1.08 | 1.77 \pm 0.97 | 0.057 | 0.49 |
| Retention Percentage | 87.85% \pm 5.16% | 91.78% \pm 4.53% | 0.002* | 0.81 |

* Statistically significant difference ($p < 0.05$)

At all time points, both teaching style groups showed high correlations between technique execution scores and service accuracy scores, with stronger correlations observed at the post-test and retention test compared to the pre-test.

Student Perception Results

Student perceptions regarding teaching methods, self-confidence levels, and learning motivation were assessed using a 15-item questionnaire with a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).



Table 7. Student Perception Scores by Teaching Style and Time (Mean \pm SD)

| Dimensions | Post-test | | Retention test | |
|------------------------------------|-----------------|------------------|------------------|-------------------|
| | Command Style | Reciprocal Style | Command Style | Reciprocal Style |
| Satisfaction with Teaching Methods | 3.80 \pm 0.67 | 4.41 \pm 0.52* | 3.72 \pm 0.71 | 4.37 \pm 0.54* |
| Self-Confidence Level | 3.63 \pm 0.72 | 4.24 \pm 0.58* | 3.24 \pm 0.78† | 4.09 \pm 0.62*† |
| Learning Motivation | 3.75 \pm 0.64 | 4.32 \pm 0.50* | 3.48 \pm 0.73† | 4.19 \pm 0.55*† |
| Overall Perception | 3.73 \pm 0.58 | 4.32 \pm 0.43* | 3.48 \pm 0.65† | 4.22 \pm 0.48*† |

* Significantly different from Command Style at the same time point ($p < 0.05$)

† Significantly different from Post-test in the same group ($p < 0.05$)

The reciprocal style group reported considerably higher satisfaction with the teaching method, self-confidence, learning motivation, and overall perception compared to the command style group on the post-test and retention test (all $p < 0.001$).

A Wilcoxon signed-rank test revealed a significant decrease in self-confidence ($Z = -3.525$, $p < 0.001$), learning motivation ($Z = -3.139$, $p = 0.002$), and overall perception ($Z = -3.408$, $p = 0.001$) in the command style group from the post-test to the retention test. The reciprocal style group also experienced a significant decrease in self-confidence ($Z = -2.121$, $p = 0.034$) and learning motivation ($Z = -2.060$, $p = 0.039$), but the level of the decrease was less than that of the command style group.

Discussion

The findings of this study accord with other earlier studies that identified the advantages of the reciprocal approach in motor skill learning. The reciprocal method actively involves learners in decision-making and judgment, which can improve skill learning (Tsivitanidou & Constantinou, 2016; Tsivitanidou, Constantinou, Labudde, Rönnebeck, & Ropohl, 2018). The findings of this study support this perspective, with the reciprocal style group improving more in serve accuracy (a 19.73-point gain from pre-test to post-test) than the command style group (a 14.64-point increase).

These findings are also consistent with the findings of AL-Jaafreh and Alma'aitah (2023), who discovered that the reciprocal method is more effective in sports that require the help of a partner, such as badminton. The reciprocal style's social interaction and peer feedback improved understanding of the technical components of the low backhand serve, resulting in significantly higher technique execution scores (21.37 ± 2.11) compared to the command group (18.50 ± 2.82) on the post-test.

A crucial aspect of this study was the analysis of skill retention following four weeks of no practice. The reciprocal style group had a higher retention rate (92.33%) than the command style group (85.75%), with a statistically significant difference ($p < 0.001$) and substantial effect size ($d = 1.38$). These findings build on earlier research by indicating that the benefits of the reciprocal approach extend beyond initial skill learning and into long-term skill maintenance.

The significant correlation between technique execution scores and serve accuracy ($r = 0.75-0.80$ on the retention test) underscores the necessity of learning good technique in order to obtain high serve accuracy. This is congruent with the findings of Ahmed and Kazir (2007), who stated that suitable teaching methods may accelerate the learning process and fix technical errors in badminton skills.

Data on student perceptions provide valuable insights into the potential mechanisms that explain the reciprocal style's greater performance. Students in the reciprocal group reported considerably better levels of satisfaction with the teaching style, self-confidence, and motivation to learn as compared to the command group. The differences continued even during the retention test, with a slight decrease in both groups.

These findings align with the principles of social learning theory, which emphasizes the importance of social interaction and feedback in motor learning (de la Fuente, Kauffman, & Boruchovitch, 2023). In the reciprocal style, students learn not only through direct practice but also by observing, evaluating, and providing feedback to their peers (Schünemann, Spörer, Völlinger, & Brunstein, 2017). This process appears to improve their understanding of the important components of the skill and encourage the development of stronger cognitive representations of the movement, resulting in improved skill retention (Clark, Schumann, & Mostofsky, 2015; Simpson, Ellison, Carnegie, & Marchant, 2021).



According to these data, the reciprocal approach has a considerable advantage over the command style in learning and retaining the low backhand serve talent in badminton among high school students. These benefits appear to result from students' active participation in the learning process, which includes providing and receiving feedback, as well as greater self-confidence and motivation.

Conclusions

This study found that a reciprocal teaching style outperformed a command style in terms of learning and retention of the low backhand serve skill in badminton among high school students. The reciprocal style resulted in higher serve accuracy, longer-term skill retention (92.33% vs. 85.75%), and better technique execution on post-test and retention tests. Furthermore, there was a significant positive correlation between technique execution and serve accuracy in both groups, with students in the reciprocal style group reporting better levels of satisfaction, confidence, and motivation to learn. The reciprocal style appears to be superior because students actively engage in the learning process, including offering and receiving direct peer feedback, which promotes the building of stronger cognitive representations of the skill. These findings have practical significance for physical educators and badminton coaches, indicating that social contact and peer feedback-based learning approaches, such as the reciprocal style, may be more beneficial for developing and retaining technical badminton skills

Financing

This research did not have any funding.

References

- Adhi Virama, L. O., Karim, K., & Dalman, D. (2023). Pengaruh Teaching Game For Understanding (Tgfu) Terhadap Hasil Belajar Permainan Sepak Bola (Studi Dalam Konteks Sekolah Dasar). *Taksonomi: Jurnal Penelitian Pendidikan Dasar*, 3(2 Se-Articles), 86–92.
- Aelterman, N., Vansteenkiste, M., Haerens, L., Soenens, B., Fontaine, J. R. J., & Reeve, J. (2019). Toward An Integrative And Fine-Grained Insight In Motivating And Demotivating Teaching Styles: The Merits Of A Circumplex Approach. *Journal Of Educational Psychology*, 111(3), 497-521. <https://psycnet.apa.org/doi/10.1037/edu0000293>
- Al-Jaafreh, O. J., & Almaaitah, M. N. Y. (2023). Comparing The Impact Of Using The Command And The Reciprocal Style On The Accuracy Of The Backhand Low Serve Skill In Badminton Game. *Revista Iberoamericana De Psicología Del Ejercicio Y El Deporte*, 18(4), 431–436.
- Al-Sharifi, W., & Al-Zubaidi, Q. (2006). Teaching Method In Learning Some Of The Basic Skills Of Football Game. *Dirasat: Educational Sciences*, 33(2).
- Aslam, M. U., Bashir, A., Draz, W. U., & Raja, H. M. M. (2019). Optimized Shuttlecock Propulsion Machine To Facilitate Badminton Training. *2019 International Conference On Electrical, Communication, And Computer Engineering (Icecce)*, 1–6. Ieee.
- Ardha, M. A. Al, Nurhasan, N., Wiriawan, O., Purnomo, M., Wijaya, A., Arief, N. A., ... Putra, K. P. (2024). Analysis of badminton research trend in the last three decades: bibliographic analysis of Scopus journal database. *Retos*, 60, 129–139. <https://doi.org/10.47197/retos.v60.102822>
- Bartholomew, K. J., Ntoumanis, N., Mouratidis, A., Katartzi, E., Thøgersen-Ntoumani, C., & Vlachopoulos, S. (2018). Beware Of Your Teaching Style: A School-Year Long Investigation Of Controlling Teaching And Student Motivational Experiences. *Learning And Instruction*, 53, 50–63. <https://doi.org/10.1016/j.learninstruc.2017.07.006>
- Byra, M., Sanchez, B., & Wallhead, T. (2014). Behaviors Of Students And Teachers In The Command, Practice, And Inclusion Styles Of Teaching: Instruction, Feedback, And Activity Level. *European Physical Education Review*, 20(1), 3–19. https://doi.org/10.1177/1356336X13495999?urlappend=%3Futm_source%3Dresearchgate.net%26medium%3Darticle



- Capel, S., Lawrence, J., Martens, M., & Rahman, H. A. (2022). *Cpd For Teaching And Learning In Physical Education*. Routledge.
- Carey, N., Simonton, K. L., & Byra, M. T. (2023). Using A Flipped Classroom To Improve Student Analysis And Feedback To Peers In The Reciprocal Style Of Teaching. *Journal Of Physical Education, Recreation & Dance*, 94(7), 35–39. https://doi.org/10.1080/07303084.2023.2237551?urlappend=%3Futm_source%3Dresearchgate.net%26medium%3Darticle
- Genoz, J. (2015). Content-Based Instruction And Content And Language Integrated Learning: The Same Or Different? *Language, Culture And Curriculum*, 28(1), 8–24. https://doi.org/10.1080/07908318.2014.1000922?urlappend=%3Futm_source%3Dresearchgate.net%26medium%3Darticle
- Chatoupis, C., & Vagenas, G. (2018). Effectiveness Of The Practice Style And Reciprocal Style Of Teaching: A Meta-Analysis. *Physical Educator*, 75(2), 175–194. <https://doi.org/10.18666/TPE-2018-V75-12-7920>
- Clark, D., Schumann, F., & Mostofsky, S. H. (2015). Mindful Movement And Skilled Attention. *Frontiers In Human Neuroscience*, 9, 297. <https://doi.org/10.3389/fnhum.2015.00297>
- Cohn, B. S. (2016). The Command Of Language And The Language Of Command. In *The Rise And Fall Of Modern Empires, Volume Ii* (Pp. 49–102). Routledge.
- Cuellar-Moreno, M. (2016). Effects Of The Command And Mixed Styles On Student Learning In Primary Education. *Journal Of Physical Education And Sport*, 16(4), 1159. <https://doi.org/10.7752/jpes.2016.04186>
- De La Fuente, J., Kauffman, D. F., & Boruchovitch, E. (2023). Past, Present And Future Contributions From The Social Cognitive Theory (Albert Bandura). *Frontiers In Psychology*, Vol. 14, P. 1258249. Frontiers Media Sa. <https://doi.org/10.3389/978-2-8325-3296-6>
- Edmizal, E., Rahman, D., Barlian, E., Donie, & Alnedral. (2024). Tactics and strategy analysis in professional badminton: insights from match data and performance metrics- a systematic review. *Retos*, 61, 78–85. <https://doi.org/10.47197/retos.v61.109716>
- Hewitt, M. C. (2015). *Teaching Styles Of Australian Tennis Coaches: An Exploration Of Practices And Insights Using Mosston And Ashworth's Spectrum Of Teaching Styles*. University Of Southern Queensland.
- Ihsan, F., Nasrulloh, A., & Nugroho, S. (2024). Analysis Of Key Factors Affecting The Achievement Of Badminton Athletes At The International Level: A Systematic Review. *Fizjoterapia Polska*, 24 (2): 374-382. <https://doi.org/10.56984/8ZG5608D4E>
- Jo, E. (2025). Development Of Sequential Winning-Percentage Prediction Model For Badminton Competitions: Applying The Expert System Sequential Probability Ratio Test. *Bmc Sports Science, Medicine And Rehabilitation*, 17(1), 48.
- Maliki, O., Suherman, W. S., Prasetyo, Y., Dwi Pradipta, G., Yudhistira, D., & Dameria, F. D. (2025). Developing A Traditional Game-Based Physical Education Learning Model To Improve Students' Physical Fitness: Content Validity. *Retos: Nuevas Perspectivas De Educación Física, Deporte Y Recreación*, (62): 787-796. <https://doi.org/10.47197/retos.v62.110401>
- Maliki, O., Suherman, W. S., Prasetyo, Y., Pradipta, G. D., Paryadi, Virama, L. O. A., ... Dameria, F. D. (2025). Developing a traditional game-based physical education learning model to improve students' physical fitness: content validity. *Retos*, 62(2009), 787–795. <https://doi.org/10.47197/retos.v62.110401>
- Raehang, Virama, L. O. A., & Yudhistira, D. (2025). Identifying Challenges and Opportunities in the Implementation of Mobile Learning in Physical Education: A Literature Review. *Physical Education Theory and Methodology*, 25(3), 719–724. <https://doi.org/10.17309/tmfv.2025.3.29>
- Santoso, N., Pambudi, A. F., Prayadi, H. Y., Utami, N. S., & Yudhistira, D. (2024). How Do The Learning Models Of Teaching Game For Understanding And Problem-Based Learning Influence Fundamental Football Skills In Physical Education? Conducting An Analysis In The Elementary School Context. *Physical Education Theory And Methodology*, 24(5), 793–798. <https://doi.org/10.17309/tmfv.2024.5.15>
- Schünemann, N., Spörer, N., Völlinger, V. A., & Brunstein, J. C. (2017). Peer Feedback Mediates The Impact Of Self-Regulation Procedures On Strategy Use And Reading Comprehension In Reciprocal Teaching Groups. *Instructional Science*, 45, 395–415. <https://doi.org/10.1007/s11251-017-9409-1>



- Simpson, T., Ellison, P., Carnegie, E., & Marchant, D. (2021). A Systematic Review Of Motivational And Attentional Variables On Children's Fundamental Movement Skill Development: The Optimal Theory. *International Review Of Sport And Exercise Psychology*, 14(1), 312–358. <https://doi.org/10.1080/1750984X.2020.1809007>
- Tsivitanidou, O. E., & Constantinou, C. P. (2016). A Study Of Students' Heuristics And Strategy Patterns In Web-Based Reciprocal Peer Assessment For Science Learning. *The Internet And Higher Education*, 29, 12–22. <https://doi.org/10.1016/j.iheduc.2015.11.002>
- Tsivitanidou, O. E., Constantinou, C. P., Labudde, P., Rönnebeck, S., & Ropohl, M. (2018). Reciprocal Peer Assessment As A Learning Tool For Secondary School Students In Modeling-Based Learning. *European Journal Of Psychology Of Education*, 33, 51–73. <https://doi.org/10.1007/s10212-017-0341-1>

Authors and translators' details:

| | | |
|-----------------------------|--|--------|
| Dwi Lorry Juniarisca | dwijuniarisca@unesa.ac.id | Author |
| Adhega Wijaya | adhegawijaya@unesa.ac.id | Author |
| Aprilyan Putra Bimantoro | apriyanbimantoro@unesa.ac.id | Author |
| Shidqi Hamdi Pratama Putera | Shidqiputera@unesa.ac.id | Author |
| Dewangga Yudhistira | dewanggayudhistira@unesa.ac.id | Author |
| La Ode Adhi Virama | laodeadhiviratama@iainkediri.ac.id | Author |
| Yudi Dwi Saputra | yudisaputra@unesa.ac.id | Auhor |