

Innovative Learning Approaches in Sports: Comparing Teaching at the Right Level and Classical Methods for Drive Stroke Mastery

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ABSTRAK

Kurangnya pendekatan pembelajaran yang sesuai dengan tingkat kemampuan siswa sering menjadi hambatan dalam meningkatkan keterampilan olahraga, termasuk keterampilan drive stroke dalam tenis. Penelitian ini bertujuan untuk menganalisis perbedaan pengaruh pendekatan Teaching at the Right Level (TaRL) terhadap peningkatan keterampilan drive stroke dibandingkan dengan pendekatan klasikal. Penelitian ini menggunakan metode eksperimen dengan desain faktorial 2 x 2. Sampel terdiri atas 64 siswa yang dipilih secara acak, dengan pengumpulan data dilakukan melalui Forehand Groundstroke Tennis Test Accuracy dari Jennifer Love Hewitt. Analisis data menggunakan SPSS versi 25.0 meliputi uji prasyarat (normalitas dan homogenitas) dengan $\alpha = 0,05$ dan uji faktorial. Hasil penelitian menunjukkan bahwa pendekatan TaRL memberikan pengaruh signifikan terhadap keterampilan drive stroke siswa dibandingkan dengan pendekatan klasikal (nilai Sig = 0,00 < 0,05). Namun, tidak ditemukan perbedaan pengaruh keterampilan berdasarkan power otot lengan dan jenis kelamin (nilai Sig = 0,667 > 0,05), serta tidak terdapat interaksi antara pendekatan pembelajaran, power otot lengan, dan jenis kelamin terhadap keterampilan drive stroke (nilai Sig = 0,490 > 0,05). Penelitian ini menyimpulkan bahwa pendekatan TaRL lebih efektif dibandingkan pendekatan klasikal dalam meningkatkan keterampilan drive stroke. Hasil ini menunjukkan pentingnya penggunaan metode pembelajaran yang sesuai dengan tingkat kemampuan siswa untuk mencapai hasil pembelajaran olahraga yang optimal.

ABSTRACT

The lack of teaching approaches tailored to students' skill levels often hinders the development of sports abilities, including drive stroke proficiency in tennis. This study aims to analyze the differences in the effectiveness of the Teaching at the Right Level (TaRL) approach compared to classical methods in improving drive stroke skills. The research utilized an experimental method with a 2 x 2 factorial design. The sample consisted of 64 randomly selected students, and data collection employed the Forehand Groundstroke Tennis Test Accuracy by Jennifer Love Hewitt. Data analysis was performed using SPSS version 25.0, including prerequisite tests for normality and homogeneity ($\alpha = 0.05$) and factorial analysis. The results revealed that the TaRL approach significantly influenced drive stroke skills compared to the classical approach (Sig = 0.00 < 0.05). However, no significant differences were found based on arm muscle power and gender (Sig = 0.667 > 0.05), nor were there interactions among teaching approach, arm muscle power, and gender on drive stroke skills (Sig = 0.490 > 0.05). This study concludes that the TaRL approach is more effective than the classical method in improving drive stroke skills. These findings underscore the importance of implementing teaching methods tailored to students' abilities to optimize sports learning outcomes.

1. INTRODUCTION

Teaching and learning activities are integral to the educational process, spanning early childhood to higher education, and are crucial in shaping the quality of educational outcomes (Aryanti, 2024; Najah et al., 2024). The effectiveness of the learning process depends on the interaction between educators and students, encompassing the transfer of knowledge, development of skills, and cultivation of attitudes that result in measurable learning achievements (Anggriani et al., 2023; Yunus & Alim, 2023). An effective learning environment should inspire, engage, and challenge students while fostering their creativity, independence, and active participation. It must also align with their interests, talents, and physical and psychological development. Learning, at its core, is a transformative process that facilitates positive changes in individuals, including enhanced knowledge, improved attitudes and behaviors, refined skills, and broader personal growth. The success of teaching and learning activities is often determined by students' mastery of the fundamental competencies of the subject matter, achieved through the careful selection of strategies, methods, media, and learning models tailored to their needs (Muammar et al., 2023; Putri & Siswanto, 2024). In the context of sports education, particularly tennis, the mastery of foundational techniques such as the forehand drive stroke requires more than repetition; it necessitates a nuanced understanding of technical skills, coordination, and game strategy (Nur et al., 2024; Rusdiana, 2021). Innovative learning approaches such as Teaching at the Right Level (TaRL) and the classical method offer distinct pathways to achieve this mastery (Ismail et al., 2024; Zakiyah et al., 2024).

TaRL is an adaptive approach that aligns teaching methods with students' individual skill levels, enabling them to progress at their own pace and capacity without undue pressure (Irmayanti et al., 2023; Magfirah et al., 2024). By focusing on grouping learners based on their abilities, designing tailored exercises, and conducting periodic evaluations, TaRL creates an engaging and effective learning environment. Previous studies highlight the efficacy of TaRL in enhancing skill acquisition and engagement, particularly in contexts where individual abilities vary significantly (Attahira et al., 2023; Darna. et al., 2024; Putri & Siswanto, 2024). On the other hand, the classical approach emphasizes standardized instruction, repetitive practice, and centralized teaching, which, while effective in developing foundational skills, often lacks the flexibility to address individual learning needs (Aryanti, 2024; Syafaah et al., 2024). Other studies emphasize the importance of structured programs and repetition in building muscle memory, which is particularly relevant in sports like tennis (Mongsidi et al., 2023; Rohadi et al., 2021).

Recent developments in sports education have underscored the significance of integrating physical conditioning into learning approaches. Arm muscle power as a key factor influencing the effectiveness of the forehand drive stroke, not only in generating strong strokes but also in enhancing accuracy and control (Manurizal et al., 2024; Rusdiana, 2021). The integration of physical conditioning into learning approaches such as TaRL and the classical method provides a novel dimension, enabling students to develop technical skills alongside physical strength. However, research combining adaptive learning methods with physical conditioning remains limited. This study seeks to address this gap by exploring how the integration of arm muscle power into TaRL and classical approaches can enhance the teaching of forehand drive strokes in tennis. The novelty of this research lies in its dual focus on technical and physical development, offering a comprehensive framework for improving sports education.

This study aims to analyze the differences in the effectiveness of the Teaching at the Right Level (TaRL) approach compared to classical methods in improving drive stroke skills in tennis. Examining how these two approaches influence technical mastery and physical conditioning, the research seeks to identify which method is more effective in fostering the development of drive stroke skills. Additionally, this study explores the integration of arm muscle power as a critical factor in enhancing the accuracy, strength, and overall performance of the drive stroke. Through this analysis, the research aims to provide evidence-based recommendations for optimizing teaching strategies in sports education, particularly in tennis learning, thereby contributing to the advancement of adaptive and inclusive pedagogical practices.

2. METHOD

This study employs an experimental approach, utilizing a 2 x 2 factorial research design (Creswell, 2014). The research involves two groups, where the outcomes of pre-tests are compared with the post-test results of students. The treatments administered to each group are subsequently analyzed to determine the following: the differential effects of tennis drive stroke training utilizing the Teaching at the Right Level (TaRL) approach versus the classical approach. Table 1 provides an overview of the research design framework, outlining the structure and variables analyzed in this study.

Table 1. Research Frameworks

Attribute Variables	Variables Manipulative	Learning Approach	
		TaRL(A1)	Classical (A2)
High Arm Muscle Power (B1)		A1B1	A2B1
Low Arm Muscle Power (B2)		A1B2	A2B2

Description: A1B1 : group of male participants who have high arm muscle power are trained using TaRL; A2B1: group of female participants who have high arm muscle power are trained using Classical; A1B2: group of male participants who have low arm muscle power are trained using TaRL; A2B2: group of female participants who have low arm muscle power are trained using Classical

The population of this study comprises fourth-semester students enrolled in the Faculty of Sports, with a total sample of 64 participants. The sampling technique employed ensures representation and suitability for experimental analysis. The selected participants were divided into groups corresponding to the 2 x 2 factorial design, allowing for a comparative evaluation of the Teaching at the Right Level (TaRL) approach and the classical approach in learning tennis drive strokes. By focusing on this specific cohort, the study aims to generalize findings to similar populations in the sports education context, particularly those engaged in tennis skill development. Data collection in this research involved the use of tests and measurements, specifically employing the Hewitt Tennis Test to assess forehand drive accuracy (Hewitt, 1968). This standardized instrument evaluates participants' ability to execute precise groundstroke forehand drives, which is a critical component of tennis performance. The test includes indicators such as the number of successful target hits, consistency across trials, and the accuracy of stroke placement within defined zones. These indicators provide a comprehensive measurement of participants' technical proficiency and are used to compare the effectiveness of the TaRL and classical approaches in enhancing forehand drive skills.

The data analysis in this study included several stages to ensure robust statistical evaluation. First, the normality test was conducted using the Kolmogorov-Smirnov method, with assistance from SPSS 25.0 for Windows. Specifically, the Shapiro-Wilk test was applied to determine the distribution of the data. The test criterion, at a significance level of 5% ($\alpha = 0.05$), stipulated that the null hypothesis (H_0) would be accepted if the significance value (Sig.) was greater than or equal to 0.05 (Sig. ≥ 0.05), and rejected if Sig. was less than 0.05 (Sig. < 0.05). This step was essential to confirm the suitability of the data for further parametric analysis. The second stage involved hypothesis testing to examine differences in the mean values of forehand groundstroke skills between pretest and posttest results. The test criteria were defined with a significance level of 5% ($\alpha = 0.05$). The null hypothesis (H_0) was rejected if Sig. ≤ 0.05 and accepted if Sig. > 0.05 . Specifically, the analysis aimed to evaluate the impact of the Teaching at the Right Level (TaRL) approach on tennis drive stroke skills. The criteria for the hypothesis test required that H_0 be accepted if the P-value (Sig., one-tailed) was greater than or equal to the threshold value (P-value ≥ 0.05) and rejected if the P-value was below this threshold (P-value < 0.05). This approach was used to determine whether significant differences existed in the effectiveness of the TaRL approach compared to traditional methods in enhancing tennis drive stroke proficiency.

3. RESULT AND DISCUSSION

Result

The results of the Kolmogorov-Smirnov test indicated that the data was normally distributed, allowing the analysis to proceed to the two-way difference test stage. A prerequisite for the difference test is that the data must meet the assumption of normality. The normality test results for the pretest yielded a significance value of 0.662, which is greater than the threshold value of 0.05 (Sig. > 0.05). This finding confirmed that the data met the normality requirement for further parametric testing. The normality test findings summarized in Table 2.

Table 2. The Results of Data Normality Test

Item Test	Sign	Description
Pre-test	0.662	Normal

Based on the results of the analysis, the average score for the pretest was 7.187, while the average score for the posttest increased to 11.508. These findings indicate a substantial improvement in drive

stroke skills following the application of the Teaching at the Right Level (TaRL) and classical approaches. This improvement highlights the effectiveness of these approaches in enhancing the participants' technical abilities in tennis. Consequently, it can be concluded that there is a significant difference between the TaRL and classical approaches in improving the tennis drive stroke skills of fourth-semester students of the Physical Education and Recreation program at the Faculty of Sports, Universitas Sebelas Maret. The comparative analysis underscores the impact of tailored instructional strategies on skill development. Further details of the statistical analysis supporting this conclusion are presented in [Table 3](#).

Table 3. Difference in Average Results of Pre-Test and Post-Test

Item Test	N	Mean
Pre-test	64	7.187
Post-test	64	11.508

Based on the t-test output table, the significance value (sig) of 0.000 was obtained, which is smaller than the threshold value of $\alpha = 0.05$. This result leads to the rejection of the null hypothesis (H₀) and the acceptance of the alternative hypothesis (H_a). Consequently, it can be concluded that there is a significant difference in the drive stroke skills of fourth-semester students in the Physical Education and Recreation program at the Faculty of Sports, Universitas Sebelas Maret before and after receiving treatment with the Teaching at the Right Level (TaRL) approach. This finding demonstrates the effectiveness of the TaRL method in enhancing participants' drive stroke skills. In contrast, the analysis of arm muscle power for men and women revealed that there were no significant differences between individuals with high and low arm muscle power in either gender, as indicated by the comparable average results. This suggests that arm muscle power, whether high or low, does not influence the drive stroke skills in this context. Detailed results of the statistical analysis are presented in [Table 4](#).

Table 4. Results of Arm Muscle Power Analysis based on Gender

Muscle Power	Mean	Lower Bound	Upper Bound
High arm muscle power male	12.327	10.985	13.668
High arm muscle power female	11.481	10.139	12.822
Low arm muscle power male	11.712	10.370	13.053
Low arm muscle power female	11.673	10.332	13.015

[Table 5](#) presents the results of the Drive Stroke Analysis, summarizing the outcomes of the statistical tests for various factors and their interactions. The analysis includes the corrected model, intercept, gender, and the interaction between power and gender.

Table 5. Drive Stroke Analysis Results

Source	df	F	Sig.
Corrected Model	3	5.475	0.001
Intercept	1	1599.671	0.000
Gender	2	12.876	0.000
Power*Gender	1	0.168	0.667
Error	2	0.727	0.490
Total	64		
Corrected Total	63		

Based on the results presented in [Table 5](#), several key observations can be made regarding the factors influencing drive stroke skills. First, the Corrected Model shows a statistically significant effect on drive stroke skills, with an F-value of 5.475 and a significance level of 0.001, which is less than the α -level of 0.05. This indicates that the model as a whole significantly contributes to explaining variations in drive stroke performance. The Intercept further supports the model's overall significance, with an F-value of 1599.671 and a significance level of 0.000, suggesting that the baseline level of drive stroke skills is highly significant and explains a substantial portion of the variance. Regarding Gender, the analysis reveals a significant difference in drive stroke skills between genders, as indicated by the F-value of 12.876 and a significance level of 0.000, both of which are well below the 0.05 threshold. This suggests that gender plays a significant role in influencing drive stroke performance. However, the interaction between Power

and Gender reveals no significant effect, as indicated by the F-value of 0.168 and a significance level of 0.667, which is greater than 0.05. This result suggests that there is no interaction between arm muscle power (high or low) and gender in determining drive stroke performance. Lastly, the Error term, with a significance level of 0.490, and the Corrected Total, indicate that the residual variance is not statistically significant, confirming that the model is robust and well-specified.

Discussion

There are notable differences in the influence of learning through the Teaching at the Right Level (TaRL) and classical approaches, each of which offers distinct advantages and disadvantages. TaRL provides flexibility and personalization, allowing each participant to progress according to their individual capacity (Magfirah et al., 2024; Yunus & Alim, 2023). This approach fosters a more tailored learning experience, which can be particularly beneficial for participants who require customized support. In contrast, the classical approach offers a clear structure and consistency, which can be advantageous for participants who thrive in more structured learning environments. The choice of teaching method for improving drive stroke performance in tennis should consider various factors, including arm muscle power and the specific learning needs of the participants (Nur et al., 2024; Rusdiana, 2021). The selection of the appropriate approach is highly dependent on the characteristics of the participants and the intended learning objectives. A combination of both approaches could be implemented to optimize learning outcomes by integrating the flexibility of TaRL with the structured nature of classical methods (Ahjar, 2022; Amalia et al., 2024).

Despite the role of arm muscle power in drive stroke performance, the study shows no significant difference between high and low arm muscle power in male and female participants (Hewitt, 1968; Manurizal et al., 2024). Instead, factors such as technique, coordination, overall body strength, training adaptation, and psychological aspects appear to play a more crucial role. Effective drive strokes require the coordination of the entire body, and individuals with lower arm muscle power but better coordination can perform just as well as those with higher arm strength (Kibler & Meer, 2007; Pane et al., 2020). Additionally, research indicates that men and women respond differently to strength training, with women showing improvements in coordination and technique that help compensate for lower muscle strength (Agustiyanoto, 2023; Costill et al., 1994). Furthermore, psychological factors such as confidence and motivation can significantly enhance performance regardless of muscle strength (Bandura, 1997). Men may have greater muscle mass, but women often compensate with superior technique and coordination, which results in similar drive stroke performance (Bahriyanto, 2023; Crespo & Miley, 1998; Hartanto & Arifin, 2023).

There is no significant interaction between arm muscle power and drive stroke performance in male and female students. While arm muscle power is often considered an important factor in tennis, research indicates that other factors, such as technique, coordination, overall body strength, and psychological aspects, play a more crucial role (Elliott, 2006; Syamsulrizal et al., 2024). Physiological differences, such as greater muscle mass in men, do not directly correlate with drive stroke performance, as technique and coordination are more influential (Arifin et al., 2012; Crespo & Miley, 1998). Additionally, effective drive strokes require the use of total body strength, including the legs, hips, and core, rather than relying solely on arm muscle power (Hidayatullah & Purnama, 2024; Kibler & Meer, 2007). Research also suggests that while men may show greater increases in muscle strength in the short term, women often exhibit better coordination and technique, which compensates for lower muscle power (Costill et al., 1994; Jatra et al., 2024; Maulana, 2016). Furthermore, psychological factors like confidence and motivation significantly impact sports performance, influencing drive stroke effectiveness. Overall, a holistic learning program focusing on improving technical skills, coordination, and overall body strength is more effective than focusing solely on arm muscle power for enhancing drive stroke performance.

The findings of this study provide a significant contribution to the understanding of factors affecting tennis drive stroke performance. Despite the common assumption that arm muscle power is a key determinant, the study reveals that factors such as technique, coordination, overall body strength, training adaptation, and psychological aspects play a more critical role. The research shows that the effectiveness of the drive stroke is not solely dependent on arm muscle power, as individuals with lower muscle power but superior coordination and technique can perform just as effectively as those with higher muscle strength. This challenges traditional beliefs and emphasizes the importance of a holistic approach to training that focuses on the integration of various physical and psychological factors. The study also underscores that men and women may respond differently to strength training, with women compensating for lower muscle strength with improved coordination and technique, further suggesting that arm muscle power is not the sole contributor to drive stroke performance.

The implications of this research extend to tennis training programs, suggesting that a more comprehensive approach that includes the improvement of technical skills, coordination, and overall body strength is likely to yield better performance outcomes than simply focusing on enhancing arm muscle power (Nurfadhila, 2016; Seff et al., 2017). In addition, the study highlights the potential benefits of combining personalized learning methods, such as the Teaching at the Right Level (TaRL) approach, with more structured classical methods to optimize learning outcomes. This combination could be particularly effective in accommodating individual learning needs and ensuring consistent progress for participants. Based on these findings, it is recommended that tennis coaches and educators develop training programs that prioritize holistic development, integrating both technical and psychological aspects while tailoring approaches to the unique needs of each participant.

4. CONCLUSION

This study underscores the complexity of drive stroke performance in tennis, demonstrating that factors such as technique, coordination, overall body strength, and psychological aspects are more influential than arm muscle power alone. While arm muscle strength has its role, effective drive strokes require a comprehensive approach that integrates body coordination, technical skills, and mental attributes, which can compensate for variations in muscle power. The findings suggest that training programs should focus on developing a holistic skill set, emphasizing the importance of coordination and technique over mere strength. Additionally, the combination of flexible and structured learning approaches, like the Teaching at the Right Level (TaRL) alongside classical methods, offers a promising framework for enhancing participants' learning experiences and performance outcomes, ensuring that individual needs and objectives are met.

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