

THE APPLICATION OF VIDEO FEEDBACK TECHNOLOGY IN IMPROVING SHORT SERVE SKILLS IN BADMINTON

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Abstract

This study aims to determine the effect of applying Video Feedback (VFB) technology on improving short service skills in badminton games. The method used was an experiment with One Group Pretest-Posttest design on 10 students of Badminton UKM Muhammadiyah Kuningan University. Data were collected through short serve skill tests, observation, and video documentation. The results of the analysis showed a significant increase between pretest and posttest scores, with a significance value of 0.000 ($p < 0.05$), which indicated that VFB was effective in improving short service skills. These findings suggest that VFB can be an efficient and objective alternative learning method in sports training.

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INTRODUCTION

Human resource development in sports plays a crucial role in shaping high-quality individuals. This process not only focuses on improving physical, mental, and spiritual health but is also directed towards character and personality building, discipline, sportsmanship, and performance enhancement. To produce accomplished athletes, an integrated recruitment system is necessary, involving cohesion, coordination, and synergy with local regions, as well as establishing platforms to identify talented athletes (Zarwan & Hardiansyah, 2019).

One of the most popular sports in Indonesia is badminton (Pujianto in Zarwan & Hardiansyah, 2019). The core tenet of badminton gameplay involves propelling the shuttlecock over the net and ensuring it lands within the confines of the opponent's court (Rahmawati & Adityatama, 2025).

This game is enjoyed by almost all segments of society, in both large cities and rural areas. Known as a racket sport, badminton is played by hitting a shuttlecock with a racket (Suratman in Zarwan & Hardiansyah, 2019). The basic concept is to keep the shuttlecock from falling on one's own side of the court and to try to land it on the opponent's side (Zhannisa in Zarwan & Hardiansyah, 2019). This sport has been known in Indonesia for a long time, with its history tracing back to "battledore and shuttlecock" in England in the 12th century, and later becoming known as "bulutangkis" (badminton) in Indonesia because the shuttlecock, made of white duck feathers, is hit by deflecting or returning it (Sari et al., 2023). Badminton is an individual sport, played by two people (singles) or two pairs (doubles), and requires a combination of aerobic and anaerobic capabilities to win both long and short rallies ((Faude in Alifyah & Abdulloh, 2021; Jeyaraman & Kalidasan in Supriyanto & Rasyid, 2018). The rules in

badminton also continue to evolve, including the change in the scoring system from classic to rally point (Marani dkk., 2021).

In badminton, mastering basic techniques is essential for achieving maximum performance. Hitting techniques play a vital role in winning matches and must be well-mastered (Paturhman dkk., 2024). One crucial basic technique is the short serve, which involves directing the shuttlecock towards or hitting the short service line, at the intersection of the vertical line with the center line, and the vertical line with the sideline (Zarwan & Hardiansyah, 2019). Mastering a good and accurate short serve requires systematic and repetitive training, paying attention to the elements of speed and target accuracy in placing the shuttlecock, as the serve is an initial stroke that can trouble or even halt an opponent's movement. The drill method of training, where students or athletes are instructed to perform specific movements repeatedly, is an effective way to practice short serve skills to make them more directed and not too high over the net (Latue dkk., 2020).

In the teaching and learning process, feedback is a very important and inseparable element, especially for improving complex skills (Bangert-Drowns et al., 1991; Potdevin et al., 2018 in Hadiana dkk., 2020); (Mahoney et al., 2019 in Permadi & Lubis, 2022). Feedback has proven to be the most powerful instructional tool for enhancing the acquisition of both fine and gross motor skills (Young & Schmidt, 1992 in Permadi & Lubis, 2022). The development of digital technology has enabled physical education teachers to incorporate various tools and learning media to create more engaging, effective, and efficient learning experiences (Juniu, 2011; Pyle & Esslinger, 2014; Thomas & Stratton, 2006 in Hadiana dkk., 2020; Latar, 2024). The use of animated media in learning, for

example, can attract students' attention and provide quicker understanding (Novita & Novianty in Sukarini & Manuaba, 2021), even contributing to the development of students' imagination and common sense (Hapsari & Hani in Effendy dkk., 2023).

RESEARCH METHOD

This study employs an experimental method with a One Group Pretest-Posttest design to evaluate the impact of Video Feedback (VFB) technology on short service skills in badminton (Sugiyono, 2019). This design involves an initial measurement (pretest O1), the implementation of an intervention (treatment X) consisting of VFB-based training, and a final measurement (posttest O2) to assess skill improvement.

The research population consists of all 20 students from Muhammadiyah Kuningan University. The sample comprises 10 students from the university's badminton Student Activity Unit (UKM), selected using a purposive sampling technique due to their active involvement and foundational skills (Sugiyono, 2019). Data will be collected through a short service skill test (both pretest and posttest) based on (Sugiyono, 2019) Nurhasan's (2001) instrument, which has a reliability of 0.721 and a validity of 0.698. This data collection will be further supported by observation and video documentation for technical analysis (Sugiyono, 2019).

Data analysis will include descriptive statistics for an initial overview, followed by homogeneity and normality tests as prerequisite assumptions. Subsequently, a Paired Sample t-Test will be used for hypothesis testing to compare the pretest and posttest results. The decision-making criterion will be based on the p-value (< 0.05 indicating a significant effect), to determine if the application of VFB significantly improves short service skills (Sugiyono, 2019).

RESULTS AND DISCUSSION

Results

a. Descriptive Statistic Results

Descriptive Statistics					
	N	Mini mum	Maxi mum	Mea n	Std. Devi ation
Pretest service	10	45	46.40	3.565	
Posttest service	10	68	71.80	2.658	
Valid N (listwise)	10				

Based on the descriptive statistics, a significant increase is observed between the pretest mean (46.40) and the posttest mean (71.80), showing a gain of 25.4 points. Furthermore, the posttest standard deviation (2.658) is lower than the pretest (3.565), indicating greater consistency in the posttest results. This suggests that the intervention successfully improved service scores overall with more controlled data variation. To confirm the statistical significance of this improvement, further tests, such as a paired t-test, can be conducted.

b. Normality Test Results

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Pretestservice	.073	10	.200*	.995	10	1.000
Posttestservice	.151	10	.200*	.964	10	.828

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction
Based on the normality test results, both data groups (pretest and posttest) are concluded to be normally distributed. This is indicated by the significance (Sig.) values being greater than 0.05 for both tests: Kolmogorov-Smirnov (pretest = 0.200; posttest = 0.200) and Shapiro-Wilk (pretest = 1.000; posttest = 0.828). Thus, the assumption of normality is met, and parametric statistical analyses, such

as the paired t-test, can be used to test for significant differences between pretest and posttest scores. These results provide a strong basis for proceeding with parametric methods to assess the effectiveness of the intervention.

c. Homogeneity Test Results

Test of Homogeneity of Variances																
		Levene Statistic	df1	df2	Sig.	Pretests	Mean	Std. Deviation	Mean	Lower	Upper					
Pretest&Posttest	Based on Mean	.633	1	18	.437	Pretest service - Posttest service	-25.400	1.350	.427	-26.366	-24.434	-59.502	9	.000		
	Based on Median	.621	1	18	.441											
	Based on Median and with adjusted df	.621	1	15.696	.443											
	Based on trimmed mean	.633	1	18	.437											

he results of the paired t-test indicate a highly significant difference between the pretest and posttest scores ($t(9)=-59.502$, $p<0.001$). The average score increase was 25.4 points with a standard deviation of 1.35, demonstrating high consistency in this improvement. The 95% confidence interval (24.434 to 26.366) suggests that this improvement is robust and did not occur by chance. These findings strongly support the conclusion that the intervention effectively and significantly improved service scores. For future research, it may be beneficial to explore specific factors contributing to the success of this

Based on the results of Levene's Test, it can be concluded that there is no significant difference in variances between the pretest and posttest groups. This is indicated by the consistent significance (p-value) above 0.05 for all testing approaches (based on mean = 0.437, median = 0.441, adjusted df = 0.443, and trimmed mean = 0.437). With the assumption of homogeneity of variances met, parametric analyses such as the independent samples t-test or ANOVA can be performed, assuming equal variances between the two groups. These findings strengthen the validity of using parametric statistical methods for further testing of this research data. For subsequent analysis, a comparison of means with the assumption of homogeneous variances (equal variances assumed) can proceed.

d. Hypothesis – T – Test

Paired Samples Test		t	df	Sig.
Paired Differences				

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Discussion

The application of Video Feedback (VFB) technology in sports training has been widely supported by theoretical and empirical findings as an effective strategy for enhancing motor skills, including in the context of badminton. According to Sutapa (2022), external feedback in the form of visual information provides athletes with concrete insights into both errors and successes in their movement execution, thereby enabling a more precise and targeted correction process. In the learning of fundamental techniques such as the short service in badminton, VFB assists athletes in comprehensively understanding the movement patterns—something that is often difficult to achieve through verbal explanations or brief demonstrations alone.

Furthermore, the theory of motor learning proposed by Budiman (2023) emphasizes that

visual information obtained through video recordings can enhance movement perception and the formation of skill patterns through reinforcement mechanisms. Through this process, trainees are able to identify discrepancies between actual performance and the ideal model, thereby facilitating more effective internalization of movement. Thus, the use of VFB not only supports the improvement of technical skills but also reinforces cognitive and metacognitive processes in motor learning.

These findings align with previous research, such as that conducted by (Hadiana dkk., 2020), which demonstrated that VFB can enhance student learning motivation in futsal. Another study by Permadi & (Permadi & Lubis, 2022) also showed that VFB was significantly more effective than verbal feedback in improving shooting ability in petanque. Thus, this research reinforces the conclusion that VFB is an effective learning strategy within the context of sports skills, including badminton.

Pedagogically, the success of VFB in improving short service ability can be explained through motor learning theories that emphasize the importance of feedback in the skill acquisition process. Through video recordings, participants can visually observe their own movement techniques, identify errors, and make corrections independently. This process makes learning more concrete, objective, and efficient compared to conventional methods that rely solely on verbal instructions. The ability to directly review movements also strengthens participants' understanding of technical elements that might have previously been overlooked.

Furthermore, the use of VFB also fosters reflective awareness in athletes. By observing their own performance, participants gain a deep understanding of their strengths and weaknesses, and are motivated to refine their techniques to achieve better results. This impacts not only technical aspects but also psychological aspects such as increased motivation and self-confidence. Therefore, the

implementation of VFB not only technically improves short service skills but also contributes to the overall quality of sports learning.

Despite the successful results of this study, several limitations should be noted. This research involved only ten participants from a single UKM group, without a control group. This limits the generalizability of the findings. Therefore, future research is recommended to involve a larger sample and include other technical aspects in badminton such as smash, dropshot, or footwork, so that the effectiveness of VFB can be tested more broadly and deeply across various badminton skill contexts.

CONCLUSION

Based on the findings of the research conducted regarding the influence of Video Feedback (VFB) technology implementation on improving short serve skills in badminton, it can be concluded that the use of VFB has a significant effect on enhancing said skills. This is demonstrated by the increase in the average test scores from 46.40 in the pretest to 71.80 in the posttest, as well as the results of the statistical analysis using a paired sample t-test, which yielded a significance value of 0.000 ($p < 0.05$). This indicates a statistically significant difference before and after the intervention. Therefore, the application of VFB technology is effective in improving the basic short serve technique among students of the Badminton Student Activity Unit (UKM) at Muhammadiyah University of Kuningan.

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