



A Target-Based Spin Pass Training Model for Passing Accuracy in Rugby

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Abstract

This study was motivated by the low passing ability, particularly in the spin pass technique, among university rugby athletes, as indicated by poor directional accuracy, inadequate throwing power, and limited ball control. Therefore, this study aimed to examine the effect of a target-based spin pass training model on passing accuracy in rugby. The study employed a quantitative approach using a quasi-experimental one-group pretest–posttest design. The participants consisted of 14 university rugby athletes selected through purposive sampling. The intervention was conducted over 12 training sessions using a target-based spin pass training program. Passing accuracy was measured using a fixed-target spin pass test with established validity. Data were analyzed using descriptive statistics, normality testing, paired sample t-tests, and effect size analysis. The findings revealed a significant improvement in passing accuracy, with the mean score increasing from 9.63 in the pretest to 12.39 in the posttest. The paired sample t-test showed a significant difference between pretest and posttest scores ($t = -4.911$, $p < 0.05$). In addition, the effect size indicated a strong practical impact of the intervention on passing performance. These findings suggest that the target-based spin pass training model is effective in improving rugby passing accuracy and can be recommended as an innovative and structured training method for university rugby athletes.

Keywords: Target-Based Spin Pass Training, Passing Accuracy, Rugby Skills, Rugby Performance, Spin Pass Training

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A. Introduction

Physical education and sports activities play an important role in developing students' physical fitness, motor skills, and teamwork abilities. In invasion sports such as rugby, players are required to demonstrate not only physical strength and endurance but also technical skills and tactical understanding during gameplay. Rugby is characterized by high-intensity physical contact, rapid decision-making, and continuous ball movement, making technical mastery an essential factor in achieving effective team performance (Anjani et al., 2025; Sulistiya et al., 2025). Furthermore, rugby is categorized as a physically demanding sport with a relatively high risk of injury due to its contact-based nature and complex movement patterns (Diyanti et al., 2026). Therefore, players are required to possess adequate physical conditioning and technical competence to perform effectively during matches.

One of the fundamental technical skills in rugby is passing. Passing enables players to maintain ball possession, organize attacking patterns, and create scoring opportunities during gameplay. Harahap et al. (2019) explained that passing accuracy is essential for maintaining the continuity and effectiveness of team attacks. Among several passing techniques used in rugby, the spin pass is considered one of the most important because it produces a faster and more stable ball trajectory, allowing more accurate and efficient ball distribution. According to Worsfold and Page (2014), the quality of a spin pass is influenced by movement coordination, passing speed, ball velocity, and directional accuracy. Biomechanically, the spin pass technique involves coordinated movements of the legs, trunk, shoulders, arms, and wrists to generate optimal force and ball rotation (Worsfold & Page, 2014). In addition, Setiawan et al. (2023) reported that arm

muscle power, hand-eye coordination, and achievement motivation significantly contribute to spin pass performance in rugby athletes.

However, based on preliminary observations conducted during training activities of the Rugby Student Activity Unit (UKM Rugby), many athletes still demonstrated low passing accuracy, particularly in the spin pass technique. Common problems included inaccurate ball direction, inconsistent throwing power, and limited ball control during passing execution. These findings indicate that the existing training methods have not optimally improved players' passing performance. Similar findings were also reported by Harahap et al. (2019), who found that technical performance in rugby is strongly related to coordination and movement control developed through systematic training. David (2019) also emphasized that structured and repetitive spin pass exercises significantly improve rugby passing skills and game effectiveness.

Previous studies on rugby passing training have generally focused on drill-based training methods, circuit training, and general technical exercises. Agustiawan et al. (2025) reported that drill and circuit training methods significantly improved rugby passing accuracy among athletes. Meanwhile, Usmanova and Shchinov (2022) explained that structured technical training contributes significantly to improving rugby performance through repetition and movement adaptation. Although previous studies have demonstrated the effectiveness of general technical training, limited studies have specifically examined the effectiveness of a target-based spin pass training model for improving passing accuracy among university rugby athletes. This research gap highlights the need for a more structured and specific training approach emphasizing directional targets,

movement precision, ball control, and feedback-based motor learning during spin pass execution.

From a motor learning perspective, target-based training provides athletes with repetitive movement practice and immediate visual feedback, which can improve coordination, accuracy, and consistency of movement execution. The use of specific targets during training also helps athletes develop better spatial awareness and control of ball trajectory. This approach is theoretically supported by the principle of deliberate practice, where repeated and goal-oriented technical training improves movement efficiency and skill mastery (Usmanova & Shchinov, 2022). Therefore, a target-based spin pass training model is expected to improve passing accuracy more effectively than conventional passing exercises.

Therefore, this study aims to examine the effect of a target-based spin pass training model on passing accuracy among university rugby athletes. The findings of this study are expected to contribute to the development of more effective rugby training methods, particularly in improving fundamental passing skills and technical performance among student athletes.

B. Methods

This study employed a quantitative approach using a quasi-experimental method with a one-group pretest–posttest design to examine the effect of a target-based spin pass training model on passing accuracy in rugby (Green et al., 2016). In this design, participants were tested before and after the intervention without the use of a control group. Although this design has limitations in controlling external variables and internal validity threats, it was considered appropriate due to the limited number of active university rugby athletes available for the study. The pretest was conducted to measure participants'

initial passing accuracy, followed by the implementation of the training intervention, and concluded with a posttest to evaluate improvements after the training program (Akbar & Mulyaningsih, 2025).

The participants in this study consisted of 14 students who were active members of the Rugby Student Activity Unit (UKM Rugby) at Universitas Pendidikan Indonesia (UPI) Sumedang Campus, including 8 male and 6 female athletes. The sampling technique used was purposive sampling, with participant selection based on specific criteria: (1) actively participating in rugby training activities, (2) demonstrating relatively low spin pass performance during preliminary observation, and (3) being willing to participate in the entire research process. The relatively small sample size was influenced by the limited population of active rugby athletes within the university sports club context (Firmansyah & Dede, 2022).

The intervention consisted of a target-based spin pass training program conducted over 12 training sessions for six weeks, with a frequency of two sessions per week. Each training session lasted approximately 60 minutes, consisting of warm-up activities (10 minutes), target-based spin pass drills (40 minutes), and cooling down (10 minutes). The training emphasized passing accuracy using fixed targets placed at several distances, namely 7 meters, 8 meters, 9 meters, and 10 meters. During the drills, participants performed repeated spin pass movements directed toward the designated targets to improve movement coordination, ball control, passing precision, and trajectory stability. The use of repetitive target-oriented practice was intended to enhance motor learning adaptation and technical consistency in passing execution (Usmanova & Shchinov, 2022).

The instrument used in this study was the fixed-target spin pass test developed by

Rizqi et al. (2024), which has demonstrated good validity with an odd-even correlation coefficient value of 0.824. The instrument was designed to objectively assess rugby passing accuracy using a target-based scoring system. The target media consisted of concentric

scoring zones, where participants received scores based on the accuracy of the ball reaching the designated target area. The scoring criteria ranged from 1 to 4 points, where: (1) very inaccurate pass, (2) less accurate pass, (3) accurate pass, and (4) highly accurate pass (Rizqi et al., 2024).



Figure 1. Target media instruments

Source: Rizqi et al., 2024

In addition to directional accuracy, the quality of ball rotation during the spin pass was also assessed. Ball rotation performance was evaluated using four scoring categories: (1) irregular ball spin, (2) unstable but straight ball movement, (3) straight ball movement without proper spin, and (4) stable spinning ball trajectory.

Each participant performed several passing attempts toward the target at predetermined distances, and the total score obtained represented the participant's passing performance level. The use of detailed scoring criteria allowed the assessment process to be conducted more objectively and consistently.

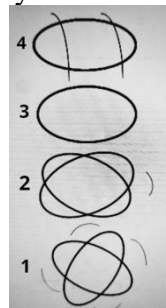


Figure 2. Rugby ball spinning instrument

Source: Rizqi et al., 2024

The research procedure began with participant briefing and informed consent prior to data collection. All participants voluntarily agreed to participate in the study after receiving explanations regarding the objectives and procedures of the research. The study was conducted in accordance with ethical principles for

human participant research, including confidentiality and voluntary participation. The pretest was administered before the intervention period, followed by 12 sessions of target-based spin pass training, and concluded with the posttest using the same measurement instrument and procedures.

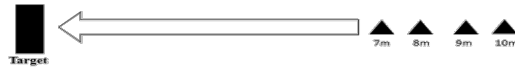


Figure 3. Spin-pass instrument test

Source: Rizqi et al., 2024

The collected data were analyzed using descriptive statistics to determine the mean, minimum score, maximum score, and standard deviation of participants' performance. A normality test was conducted using the Kolmogorov–Smirnov and Shapiro–Wilk tests to ensure that the data met the assumptions for parametric analysis (Rahmani et al., 2025). Hypothesis testing was then performed using a paired sample t-test to determine significant differences between pretest and posttest scores (Nurrohmah, 2023). In addition, effect size analysis was

conducted to evaluate the practical magnitude of the intervention effect on passing accuracy improvement. All statistical analyses were performed to determine the effectiveness of the target-based spin pass training model in improving rugby passing accuracy (Agustiawan et al., 2025).

C. Results and Discussion

Result

The descriptive statistical analysis of the pretest and posttest scores is presented in Table 1.

Table 1. Descriptive Statistics of Pretest and Posttest Scores

Variable	Pretest	Posttest
N	14	14
Minimum	5.00	10.20
Maximum	15.00	15.40
Mean	9.63	12.39
Standard Deviation	2.75	1.52

Table 1 shows that the average passing accuracy score increased from 9.63 in the pretest to 12.39 in the posttest after the implementation of the target-based spin pass training program. In addition, the standard deviation decreased from 2.75 to 1.52, indicating that participants' performance became more consistent after the intervention. The minimum score also increased from 5.00 to 10.20, while the maximum score increased from 15.00 to 15.40. The decimal values in the posttest

scores resulted from the accumulation and averaging of assessment indicators used in the spin pass instrument scoring system. Overall, these findings indicate that the target-based training model contributed positively to improving participants' passing accuracy performance.

Before conducting hypothesis testing, a normality test was performed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. The results are presented in Table 2.

Table 2. Normality Test Results

Variable	Kolmogorov–Smirnov Sig.	Shapiro–Wilk Sig.
Pretest	0.200	0.765
Posttest	0.200	0.624

Based on Table 2, both the pretest and posttest data showed significance values greater than 0.05 in the Kolmogorov–Smirnov and Shapiro–Wilk tests. Therefore, the data were considered normally distributed and met the

assumptions required for parametric statistical analysis. Consequently, the paired sample t-test could be conducted to analyze differences between pretest and posttest scores. The results of the paired sample t-test are presented in Table 3.

Table 3. Paired Sample t-Test Results

Variable	N	t	Sig. (2-tailed)
Pretest–Posttest	14	-4.911	0.000

The paired sample t-test analysis showed a t-value of -4.911 with a significance value of 0.000 ($p < 0.05$). These findings indicate a significant difference between pretest and posttest scores after the intervention. The negative t-value reflects an increase in participants' passing accuracy scores from pretest to posttest. Therefore, the target-based spin pass training model significantly improved rugby passing accuracy among the participants.

To strengthen the interpretation of the findings, an effect size analysis was also conducted using Cohen's *d*. The analysis showed a large effect size ($d > 0.80$), indicating that the intervention had a strong practical impact on improving participants' spin pass accuracy performance. This result demonstrates that the training model was not only statistically significant but also practically meaningful in rugby technical training.

Discussion

The findings of this study demonstrated that the target-based spin pass training model significantly improved passing accuracy among university rugby athletes. The increase in mean scores from pretest to posttest indicates that repetitive target-oriented practice contributed positively to the development of technical passing skills. The decrease in standard deviation also suggests that participants' performances became more consistent following the

intervention. These findings support the principle of motor learning, which emphasizes that repetitive and goal-oriented movement practice can improve movement coordination, precision, and skill consistency.

The significant improvement observed in this study can be explained through the use of specific targets during training sessions. Target-based training provides athletes with immediate visual feedback regarding ball direction and passing accuracy, allowing players to adjust and refine their movement patterns during repeated practice. According to Worsfold and Page (2014), effective spin pass performance depends on coordination, movement efficiency, and ball trajectory stability. Through repeated target-focused practice, athletes develop better spatial awareness, ball control, and movement synchronization, ultimately improving passing performance.

The findings are also consistent with previous studies conducted by Agustiawan et al. (2025), which reported that structured passing drills and circuit-based training significantly improved rugby passing accuracy. Similarly, David (2019) explained that systematic spin pass exercises contribute positively to the development of rugby technical skills and game effectiveness. Furthermore, Usmanova and Shchinov (2022) emphasized that repetitive technical training enhances skill acquisition through

adaptation and motor learning processes. Therefore, the results of the present study strengthen previous evidence regarding the effectiveness of structured technical training in rugby performance improvement.

In addition, the large effect size found in this study indicates that the intervention had substantial practical significance. This suggests that the target-based spin pass training model can be effectively implemented by rugby coaches and instructors as an alternative training strategy for improving passing accuracy among student athletes. The use of varied target distances and repeated passing exercises can help athletes develop more accurate and stable passing performance during competitive gameplay situations.

Nevertheless, this study has several limitations. First, the study employed a one-group pretest–posttest design without a control group, which may limit internal validity and reduce the ability to compare the intervention with other training methods. Second, the relatively small sample size limits the generalizability of the findings to broader rugby athlete populations. Therefore, future studies are recommended to involve larger samples, include control groups, and compare different passing training models to obtain more comprehensive findings regarding rugby technical skill development.

D. Conclusion

The results of this study indicate that the target-based spin pass training model significantly improved passing accuracy among university rugby athletes. This finding was demonstrated by the increase in the mean posttest score compared to the pretest score and supported by the paired sample t-test results showing a significant difference ($p < 0.05$). In addition, the large effect size indicates that the intervention had a strong practical impact on participants' passing performance.

Therefore, the target-based spin pass training model can be recommended as an effective and innovative training method for improving rugby passing accuracy, particularly in developing spin pass skills among university athletes.

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F. Conflict of Interest

No there is conflict interest.

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