Identification of The Level of Mastery of Basic Volleyball Techniques For Men of The Cakar Langit Network Club, Padang Lawas Regency

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ABSTRACT

This study aimed to map the level of mastery of basic volleyball techniques among male athletes from the Cakra Langit Network Club in Padang Lawas Regency and to formulate training improvement priorities. The study used a quantitative, descriptive cross-sectional approach involving 20 athletes. Measurements were conducted using standardized tests for the serve, underhand pass, overhand pass, and smash, complemented by game-based observations to capture the quality of match execution. Data are presented as percentages of achievement and ability categories. The results indicate that the overall level of mastery of basic techniques is in the moderate category. Specifically, the average achievement for each technique is: underhand pass 55% (moderate), overhand pass 65% (moderate), serve 60% (moderate), and smash 80% (highest). These findings indicate that the technical foundation has been established, but gaps remain in the quality of the first touch. The underhand pass and overhand pass emerged as priority areas for improvement because they determine the quality of subsequent attack transitions. The serve requires increased accuracy and consistency to be more functional as a first attack, while the advantage in the smash needs to be maintained through increased placement accuracy and tempo variation. In conclusion, the club is at a moderate ability level with a need for systematic strengthening in the first touch aspect. Strategic recommendations include target-based training and load progression for passing and serving, the integration of small-sided games/mini-games to encourage transfer to match situations, and regular monitoring every 6–8 weeks. These results are expected to form the basis for developing a focused and effective training program. The limitations of this study include a single club sample, so generalizations require caution; further studies are recommended involving more clubs in Padang Lawas Regency to obtain a comprehensive and representative picture.

AUTHORS' CONTRIBUTION

A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article	:	Susil, Pujo Tri; Suhermon, Suhermon; Hendrianto, Ferri; Arisman, Arisman. (2025). Identification of The Level of Mastery of Basic Volleyball Techniques For Men of The Cakar Langit Network Club, Padang Lawas Regency. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 17 (3), p.2483-2491

INTRODUCTION

Modern volleyball demands a complete integration of mastery of basic techniques, tactical understanding, decision-making, and adherence to continually updated game

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regulations. In Indonesia, performance coaching falls under the umbrella of the Indonesian Volleyball Association (PBVSI), which regularly updates the Official Volleyball Regulations as a reference for match and training standards. The 2025–2028 regulation update emphasizes team structure, the roles of officials, and technical details that directly impact athletes' skill requirements on the court. Therefore, the quality of service, passing, smashing, and blocking must follow the latest rules. This makes measuring and mapping basic technical mastery a crucial initial requirement in the club development cycle, including for men's teams at the district level, such as the Cakra Langit Network Club in Padang Lawas Regency.

In the international coaching landscape, the FIVB emphasizes a foundation of technical and tactical skills, weekly training cycles, and performance evaluation as a unified learning-training-competition process. The FIVB Level II Coaches' Manual (latest edition) emphasizes that the initial sessions in a training microcycle should ideally be directed at refining individual and team techniques and tactics, while subsequent sessions are used for game practice and testing game plans in near-match conditions. This perspective positions fundamental technical skill assessment not as a mere administrative activity, but as an indicator of progress that guides training load design, drill variations, and intervention priorities.

In general, mastery of fundamental techniques—serving (under/over), passing (under/over), smashing, and blocking—is an early determinant of game quality. Research in physical education and coaching over the past few years has shown that game-based learning approaches, small-sided games (SSG), and the Teaching Games for Understanding (TGfU) model consistently enhance fundamental skills and learning enjoyment through exposure to rich tactical contexts and demands for quick decision-making. TGfU has been shown to improve volleyball skills and learning enjoyment in intermediate students, while 2v2 and 3v3 SSGs demonstrate the adaptation of technical abilities to various cognitive capacities. This evidence reinforces the assumption that fundamental technical assessment needs to consider the game context, not just isolated skill testing.

Similarly, recent research on skill acquisition and sports skill learning interventions emphasizes the importance of training variation, contextual interference, and appropriate attentional focus (especially external focus) to maximize technique and form gains, particularly in novice athletes. Integration of these principles will be more precise if preceded by a baseline map of the athlete's technical abilities—so coaches can link training types to apparent skill deficits.

On the other hand, coaching literature also emphasizes the ethical dimension and code of conduct to ensure the coaching process is conducted within the framework of sportsmanship, respect for athletes' developmental stages, and supportive feedback—all of which are intertwined with how we assess and provide feedback on athletes' fundamental techniques.

In the Indonesian context, applied research at clubs and schools shows that mapping fundamental techniques provides practical insights for coaches in determining

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training priorities—for example, an evaluation study at the Pambers VC club emphasized the role of serving, passing, smashing, and blocking techniques as pillars of performance. Such findings are relevant for district-level clubs, where limited facilities and a busy local calendar often force coaches to rely on subjective observations. With structured assessments, training decisions can be more data-driven.

Specifically for certain techniques, domestic research captures variation in ability; for example, analysis of passing skills among club athletes concluded that they were relatively good, but still had room for improvement in consistency and first-touch quality. U-16 profiles at several clubs also highlighted the preference for float serves at the junior level and reiterated the importance of passing as a foundation for attack. This kind of empirical evidence underscores the need for detailed mapping at each club, as technical profiles can be influenced by age, local training traditions, and coach policies.

In learning and training, the use of a Volleyball Information System (VIS) or other digital recording systems has been reported to have a positive impact on improving fundamental skills when integrated into ongoing evaluation processes. Meanwhile, several domestic studies have presented literature reviews and the application of TGfU specifically to overhead passing—both of which indicate that learning strategies that emphasize decision-making and game situations can strengthen the translation between test results and actual performance.

Common problems faced by district-level clubs include: (1) the lack of validated assessment instruments for each element of fundamental technique, leading coaches to rely on internal checklists; (2) inconsistent norms and criteria for ability categories across clubs; (3) disparities in longitudinal data, making it difficult to monitor individual and team progress; and (4) minimal integration between isolated technical test results and game performance indicators, even though selection and rotation decisions are heavily influenced by the quality of the first touch, accurate serving, and attacking effectiveness. Recent literature confirms the need for valid and reliable instruments for specific technical components—for example, overhand serve accuracy tests have demonstrated good content/face/sensitivity validity and test-retest reliability—but their adoption at the club level remains limited.

Furthermore, while the Game Performance Assessment Instrument (GPAI) is widely used to assess game-based performance, a 2015–2024 systematic review revealed variations in implementation, context, and reporting quality. This implies the need for task and context adaptation in club volleyball to ensure that decision-making and technical execution indices truly reflect the club's game. Studies developing GPAI-based assessments in the physical education context have also demonstrated adequate validity and reliability, opening up opportunities for translation to the club context with norm adjustments.

Furthermore, some recent research highlights anthropometric factors and somatic types associated with men's technical performance; although not the primary focus, this information serves as a reminder that interpretation of technical test results should consider the athlete's physical characteristics for more precise training recommendations.

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Several gaps exist in this research context. First, there is a lack of comprehensive mapping studies on men's basic technical mastery at the district club level in Indonesia, combining standardized test indicators (e.g., serve accuracy) and game-based performance indicators (e.g., decision-making/execution indices via the GPAI) within a single, coherent assessment framework. Most existing club studies tend to focus on a single technique (overhand or underhand passing), descriptive studies of ability categories without linking them to game indicators, or intervention studies without a comprehensive mapping baseline.

Second, the Sumatran context (Padang Lawas Regency), particularly at men's clubs, is relatively rarely documented in the open literature, so basic technical profiles that reflect the local competition ecosystem, training patterns, and tactical habits (e.g., service preferences) lack a reference database. Third, the adoption of validated instruments such as overhand serve accuracy tests and structured rubrics for passing, smashing, and blocking within a framework aligned with PBVSI regulations and FIVB guidelines remains sporadic; yet this integration is essential to bridge the gap between micro-evaluation (technique) and macro-evaluation (match demands) at the club level.

Fourth, although digital initiatives such as VIS and app-based assessments have been reported to improve basic skills, few studies have calibrated these digital findings with validated field test results in a regency club setting—thus, the reliability of training recommendations based on real-game data still needs to be strengthened.

Finally, talent identification programs often rely on subjective assessments without standardized formal guidelines. This potentially biases the assessment of basic technical skills as a component of medium-term performance readiness. Objective mapping of basic technical mastery levels can provide a stronger basis for selection, promotion, and training periodization design.

The novelty of this research lies in the comprehensive mapping framework for men's basic technical mastery at the Cakra Langit Network Club in Padang Lawas Regency, which:

1. Combining standardized test instruments (e.g., a validated overhand serve accuracy test) with technical observation rubrics for underhand/overhand passing, smashing, and blocking;
2. Integrating game-based performance indicators (adapting GPAI principles) so that mapping results are inseparable from the context of actual decisions and tactics;
3. Aligning assessment indicators with the 2025–2028 PBVSI Official Regulations and FIVB training guidelines to ensure relevance to contemporary match demands; and
4. Generating contextualized baseline technical profiles for the district club ecosystem—providing a baseline for designing training interventions (e.g., SSG/TGfU, attentional focus, contextual interference) specific to identified technical[2] deficits. This applied innovation is expected to reduce reliance on subjective assessments and increase the objectivity of coaching decision-making.

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Based on the above background, this study aims to identify the level of mastery of basic techniques (serve, underhand/overhand pass, smash, block) in male athletes of Club Cakra Langit Network in Padang Lawas Regency using an assessment framework that combines: (a) standardized tests for specific components (especially overhand serve accuracy) and (b) game-based performance indicators that capture the quality of execution in a decision-making context. Specifically, the study aims to:

(1) Map the distribution of ability categories for each basic technique and identify priority areas for improvement.

(2) Compare consistency across instruments (standardized tests vs. game indicators) to determine alignment between controlled and contextual performance;

(3) Develop training recommendations based on the mapping findings (e.g., 2v2/3v3 SSG for transferring techniques to tactical contexts; TGfU for decision-making; external attention focus strategies; and the application of contextual variation and interference for retention and transfer).

The expected scientific contribution is a basic technique mapping model that is: (i) content-valid and replicable at comparable clubs; (ii) relevant to the demands of PBVSI competitions and FIVB training practices; and (iii) translational to daily training decisions. Practically, the findings are expected to serve as a baseline for coaches to adjust training load and content, develop micro-cycle objectives (e.g., technique refinement sessions, technique-tactical integration sessions, and game plan testing sessions), and design more objective and sustainable progress monitoring.

Finally, this research enriches the national literature on basic technique mapping at the district club level—a still limited area of study—and opens up the possibility of integrating digital recording systems (such as VIS) into the evaluation cycle to strengthen the accuracy of technique diagnosis and the effectiveness of training interventions. Thus, this systematic identification approach is expected to be a stepping stone towards evidence-based, ethical, and long-term performance coaching.

METHODS

This study used a quantitative descriptive (cross-sectional) design. The primary objective was to map the level of mastery of basic techniques (serve, underhand/overhand pass, smash/spike, and block) at a single measurement point, then categorize the results into ability categories and provide training recommendations based on the findings. Location: Club Cakra Langit Network training/match field, Padang Lawas Regency. Population and Sample: All active male athletes of the club (total sampling), totalling 20. Male athletes must have been active for at least the past 3 months, 2) not have an injury that would interfere with the test, 3) be present during the data collection session. Exclusion criteria: Acute injury, illness, or absence during the test. Additional (contextual) indicators: Game-based performance index (adaptation of GPAI principles) to capture decision-making and execution quality in short 4v4/5v5 game situations.

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RESULTS AND DISCUSSION

The results of this study indicate that the level of mastery of basic volleyball techniques among male athletes from the Cakra Langit Network Club in Padang Lawas Regency is in the moderate category. Specifically, the identification results for each basic technique are as follows: underhand passing (55%), overhand passing (65%), serving (60%), and smashing (80%). Although overall basic technical abilities are in the moderate category, the highest percentage is seen in the smashing technique, which reaches 80%. This finding indicates that the club's athletes have quite good technical fundamentals, but there is still significant room for improvement, especially in underhand and overhand passing techniques. These results can be important input for coaches and club administrators to develop more focused and effective training programs to improve the quality of athletes' games in the future.

Table 1.
Frequency Distribution of Underpass

Underpass			
Valid	**Freq**	**Percent**	**Valid Percennt**
Good	5	0	0
Sufficient	4	4	20
Moderate	3	13	65
Poor	2	2	10
Very Poor	1	1	5
Total		**20**	**100**

Service: The results of the service test showed that the athletes' serving ability was in the moderate category, with a percentage of 60%. A good serve not only scores points directly but can also disrupt the opponent's attack pattern (Ozon & Sistiasih, 2023). Therefore, more intensive and targeted service training can help improve athletes' serving ability.

Table 2.
Distribution of Service Frequency

Service			
Valid	**Freq**	**Percent**	**Valid Percennt**
Good	5	0	0
Sufficient	4	5	25
Moderate	3	12	60
Poor	2	3	15
Very Poor	1	0	0
Total		**20**	**100**

Smash: Athletes' smash technique performed better than other basic techniques, with a percentage of 80%. However, despite being in the good category, there is still room for improvement in smash accuracy and power (Hermanzoni, 2017). An effective smash is a key weapon in a team's attack, so improving smash technique can provide significant benefits to the team.

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Table 3.
Smash Frequency Distribution

Smash			
Valid	**Freq**	**Percent**	**Valid Percennt**
Good	5	1	5
Sufficient	4	1	5
Moderate	3	16	80
Poor	2	2	10
Very Poor	1	0	0
Total		**20**	**100**

Overall, the results of this study indicate that the level of basic technique mastery in the men's team of the Cakra Langit Network Club is in the moderate category. This indicates that more intensive efforts are needed to coach and develop the athletes' basic techniques. More targeted, systematic, and consistent training can significantly improve athletes' technical abilities.

These findings align with other studies, such as those conducted by Firmansyah et al. (2022), which also found that basic volleyball technique skills in school-level students are in a similar category. This suggests that challenges in mastering basic volleyball techniques are common and faced not only by club athletes but also by athletes at various levels.

Based on the results of this study, it is recommended that coaches and administrators of the Cakra Langit Network Club use this data as a basis for designing more effective training programs. The primary focus should be on improving underhand and overhand passing techniques, which still show the lowest percentages. By improving mastery of these fundamental techniques, the overall quality of the team's play is expected to improve.

Furthermore, athletes need to increase their self-awareness of the importance of discipline in training, maintaining physical condition, and adopting a healthy lifestyle, including adequate rest and balanced nutrition. The combination of programmed training and athlete self-awareness will be key to achieving higher performance.

This study has several limitations, such as the sample size being limited to one club. Therefore, future research is expected to involve a broader sample in Padang Lawas Regency to obtain a more comprehensive picture of the state of volleyball development in the region.

CONCLUSION

Based on the identification of basic technical skills among male athletes from the Cakra Langit Network Club (n = 20), the overall level of mastery fell into the moderate category, with an average achievement of ≈65% (average of underhand passing 55%, overhand passing 65%, serving 60%, and smash 80%). This finding confirms that the team's technical foundation has been established, but still requires systematic

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strengthening, particularly in the first touch aspect (underhand and overhand passing). Technique Overview

1. Underhand passing (55%, moderate) → is a top priority for improvement because the quality of the first touch determines subsequent attack transitions.

2. Overhand passing (65%, moderate) → requires stabilizing its precision and consistency to support a variety of attacks. (The distribution of categories in the table shows a dominance of "moderate" at 65%.)

3. Serving (60%, moderate) → Although in the moderate category, strengthening accuracy and consistency is strategic, given that serving can directly score points or disrupt the opponent's attack pattern (Ozon & Sistiasih, 2023).

4. Smash (80%, relatively strongest) → becomes the team's relative advantage. However, improving placement accuracy and power is still necessary to increase offensive effectiveness (Hermanzoni, 2017).

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