Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 8, No. 2, April 2026 , Pg. 1060-1065
DOI: 10.35724/mjpes.v8i2.8156

Analysis of Spiking Ability Among Boys in the SMP Negeri 45 Martubung Volleyball Club (2026)

Yonathan Alexander Barus[1], Dicky Hendrawan[2]
[1] Sekolah Tinggi Olahraga dan Kesehatan Bina Guna, Medan, Indonesia
[2] Sekolah Tinggi Olahraga dan Kesehatan Bina Guna, Medan, Indonesia
Corresponding Author: yonatankarokaro@gmail.com

Abstract
Objectives: This study aims to analyze the smashing ability in volleyball of male students participating in the volleyball extracurricular activity at SMP Negeri 45 Martubung, 2026.
Materials and Methods: The subjects selected in this study were all 18 male students participating in the volleyball extracurricular activity. This study used a quantitative approach with descriptive methods. Descriptive methods are used to systematically and objectively describe students smashing ability in volleyball without providing special treatment to the research subjects.
Results: The results of the smash accuracy study revealed that the highest score obtained by students was 22, the lowest score was 13, with a mean of 16.61 and a standard deviation of 2.63. The total accuracy score for the entire sample was 299. Meanwhile, in the smash technique category, the highest score obtained by students was 14, the lowest score was 10, with a mean of 12.56 and a standard deviation of 1.15.
Conclusions: The conclusion reached from the study regarding the smashing ability in volleyball of male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung in 2026 was overall in the good category. This is demonstrated by the highest frequency percentage, with 13 students (72.2%) in the good category.
Keywords: Smash Accuracy; Smash Technique; Volleyball.

Introduction

Physical education at the junior high school level plays an important role in helping students develop movement skills, physical fitness, and positive attitudes toward sports activities. Through physical activity based learning, students are not only trained to move but are also encouraged to understand the values of cooperation, sportsmanship, and discipline. Therefore, the quality of physical education instruction has a significant influence on the development of students' motor skills. Volleyball is one of the main subjects in physical education and is also a popular sport in extracurricular activities at the junior high school level. The game requires mastery of various interconnected basic techniques, such as serving, passing, blocking, and smash. Success in playing volleyball is not determined solely by mastery of a particular technique but also by the ability to combine these techniques appropriately in game situations.

Among the various skills in volleyball, the basic smash (or spike) technique is often considered the heart of the aesthetics and dynamics of the game. Mastering the smash technique is not simply a matter of how high a player can jump or how hard the ball can be hit into the opponent's court. More than that, the smash is an art of coordination involving intuition, precise timing, muscle strength, and the courage to make decisions within a matter of seconds while airborne. For students, successfully executing a sharply descending smash provides tremendous emotional satisfaction, fostering self confidence and creating excitement that can spread throughout the team. However, behind its beauty, the smash is one of the most difficult and complex techniques for junior high school students. Without a proper foundation in movement mechanics, ranging from a rhythmic approach, powerful two foot takeoff, body extension in the air, to safe landing, students may not only fail to produce points but may also be more vulnerable to injury. Therefore, analyzing smash ability is not merely a matter of numerical scores but an

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 8, No. 2, April 2026 , Pg. 1060-1065
DOI: 10.35724/mjpes.v8i2.8156

effort to understand the extent to which students are able to control their bodies and manage their emotions on the court.

The need for well developed technical mastery is difficult to fulfill by relying solely on Physical Education, Sports, and Health (PJOK) lessons, which have very limited instructional time. This is where extracurricular activities provide a crucial space for students to develop their abilities. Volleyball extracurricular activities at the junior high school level are not merely an outlet for adolescents' abundant energy but also a meaningful environment where interest meets talent development. During junior high school, students are in a transitional stage that is both exciting and vulnerable; they are searching for their identities and seeking recognition from their peers. Through extracurricular communities, they learn the meaning of commitment, experience the disappointment of defeat, and appreciate the satisfaction of struggling together toward a common goal.

However, the reality in the field often presents significant challenges. Male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung come from diverse backgrounds in terms of skill levels, physical characteristics, and natural abilities. Some students have excellent jumping ability but struggle to coordinate their arm swing, while others possess powerful hitting ability but frequently have untimely approach steps. As an activity intended to prepare students to represent the school in competitive achievement, training within the extracurricular program should no longer be conducted through trial and error or merely based on the principle that the important thing is for students to play. Coaches or supervising teachers are often caught up in routine training activities without having sufficient opportunities to identify in detail where their students' technical development is being hindered. When a male student fails to execute a smash, it is important to determine precisely whether the problem lies in power, the direction of the ball from the setter, or the coordination of the approach steps.

Recognizing these conditions, a more human centered and measurable approach is needed. Research focusing on the smash ability of extracurricular participants is not intended to judge who is skilled and who is weak. Instead, it represents an effort to understand each student holistically, identify their hidden potential, and provide honest feedback so that they can continue to develop.

Through this analysis, the results of smash ability assessment can serve as a basis for designing more effective and realistic training programs that respect each student's learning process and correspond to the actual needs of extracurricular participants. Training programs should no longer be general in nature but can be focused on improving specific technical aspects that remain weak, such as the approach, takeoff, or arm swing. From the students' perspective, they can identify their strengths and weaknesses in performing the smash, thereby increasing their motivation to improve through targeted training. In this way, the volleyball court can truly become a place where they grow into resilient individuals, both physically and mentally. Thus, the analysis of smash ability functions not only as an assessment activity but also as part of a reflective and continuous development process. This analysis is expected to support the improvement of the quality and achievements of the school's volleyball extracurricular program.

Materials and Methods

Study Design

This study employs a quantitative approach using a descriptive method. The descriptive method is utilized to provide a systematic and objective account of students' smashing

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 8, No. 2, April 2026 , Pg. 1060-1065
DOI: 10.35724/mjpes.v8i2.8156

ability in the game of volleyball, without applying any specific interventions to the research subjects.

Study Participants

The population for this study consists of all male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung in 2026, totaling 18 students. The sample for this study comprises all 18 male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung.

Study Organization

The instrument used in this study is an observation sheet for a volleyball smash ability test. The test instrument employed to measure smash ability is based on principles for assessing volleyball technical skills, specifically evaluating the accuracy of the hit's direction and the quality of the movement technique. In physical education, the assessment of a smash can be conducted through a practical test, in which students are given multiple opportunities to perform a smash toward a designated target area on the court.

Statistical Analysis

The data obtained from the smash ability test were analyzed using descriptive statistical analysis. The analysis included calculating the mean to determine the average score of the data and calculating percentages to determine the students' smash ability categories. The mean was calculated by dividing the total score by the number of samples, while the percentage was calculated by dividing the number of students in each category by the total number of samples and multiplying the result by 100%.

Results

1. Data Description

This study aims to assess the smashing ability of male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung in 2026. The assessment involved 18 student participants, focusing on two key aspects: smash accuracy and smash technique. The combined scores from these two areas represent each student's overall smashing ability.

In detail, the research data statistics are as follows: For the smash accuracy category, the highest score obtained by a student was 22, and the lowest was 13, with a mean of 16.61 and a standard deviation of 2.63. The total accuracy score for the entire sample was 299. Regarding the smash technique category, the highest score was 14, and the lowest was 10, with a mean of 12.56 and a standard deviation of 1.15. The total technique score for the entire sample was 226. When combining the scores for accuracy and technique, the overall total score reached 525. The highest individual score was 36, the lowest was 23, with a mean of 29.17 and a standard deviation of 3.64.

2. Frequency Distribution of Smash Ability Categories

Based on the total data for smash ability (combining accuracy and technique), students' skill levels are classified into 5 categories according to standard interpretation criteria. The frequency distribution of these scores is presented in the following table:

Table 1. Distribution of Smash Ability Assessments

No	Mark	Category	Frequency	Percentage
1	33 – 40	Very Good	3	16,7%
2	25 – 32	Good	13	72,2%
3	17 – 24	Enough	2	11,1%
4	9 – 16	Poor	0	0%
5	0 – 8	Very Poor	0	0%
Total			**18**	**100%**

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 8, No. 2, April 2026 , Pg. 1060-1065
DOI: 10.35724/mjpes.v8i2.8156

Based on the data in the table above, the distribution shows that 3 students (16.7%) fall into the Very Good category namely Fiqri (35), Naufal (36), and Hans (36). The Good category constitutes the majority, with 13 students (72.2%). There are 2 students (11.1%) in the Enough category: Arqi (23) and Fransiskus (24). No students fall into the Poor or Very Poor categories (0%).

The distribution of the smash ability assessment for male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung in 2026 is presented in the graph below:

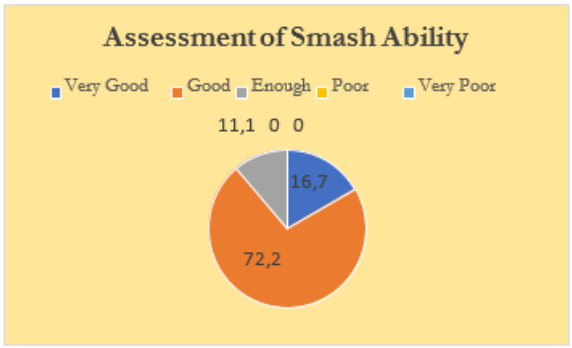


Figure 1. Graph of Smash Ability Assessment

Discussion

Based on the results of the analysis presented, the smash ability of male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung was generally classified as Good. This was empirically demonstrated by the largest percentage, which accounted for 72.2% (13 students) of the data. The group mean score of 29.17 also clearly fell within the interval of 25–32, which corresponds to the Good category. The assessment, which covered two aspects, namely accuracy and technique, revealed the following patterns of students' skill mastery on the court:

1. Analysis of Smash Technique Mastery: The mean score for the technique aspect was 12.56. When examined by component, the indicators of Approach, Ball Contact, and Hitting Direction were generally well mastered by the students, with consistent scores of 3. However, the Take off and Landing components were predominantly scored 2 by most of the sample. This indicates that the jumping phase, particularly lower limb power and timing, as well as the landing position for safe movement, still require more precise biomechanical training to reduce the risk of injury and maximize jump height.
2. Analysis of Smash Accuracy: The mean accuracy score was 16.61. The data pattern indicated a positive relationship: students with higher technique scores, such as Fiqri, Naufal, and Hans, who obtained a technique score of 14, also demonstrated very high smash accuracy, with accuracy scores of 21 and 22. This finding supports the principle in sports that mechanically correct, systematic, and well executed movement techniques contribute to maximum effectiveness and accuracy when directing the ball toward the opponent's target area. The high proportion of students classified as Good provides a positive indication that the volleyball extracurricular training program at SMP Negeri 45 Martubung has been implemented in an appropriate direction. The frequency, intensity, and seriousness of students' training have contributed meaningfully to their mastery of the basic smash skill.

The research findings also showed a very strong relationship between the mechanical mastery of basic technical components and the final result of smash accuracy on the court. In the technical aspect, the majority of students had mastered the Approach, Ball Contact, and Hitting Direction indicators consistently, with an average score of 3 for each indicator. This indicates that, both cognitively and psychomotorically, the

extracurricular participants understood the correct approach steps, how to contact the ball at the upper back portion to generate topspin, and where the ball should be directed. Mastery of these fundamental elements serves as the primary foundation for explaining why none of the students were classified as Poor or Very Poor in their smash ability.

However, the data visualization also revealed that the technical components of Take off and Landing were comparative weaknesses experienced by nearly all participants, as reflected by the predominance of score 2. From the perspective of sports kinesiology, an inadequate take off limits the students' reach height, or highest point of reach, in the air. When the jump does not reach its optimal peak, the hitting window becomes narrower, making the attack more vulnerable to being blocked by the opponent or hitting the net. Meanwhile, the low scores in the landing phase, in which students tended to land with rigid or unstable support, not only affected their transition into the ready position for the next rally but also increased the risk of acute injuries to the ankle and knee joints.

Interestingly, this dynamic resulted in a varied distribution of accuracy scores while remaining within a generally positive range. Students such as Fiqri, Naufal, and Hans achieved the Very Good category, with the highest accuracy scores of 21 and 22 points, because they were among the few participants who obtained high scores (3 points) in the Take off technical component. Their ability to utilize lower limb explosive power during the vertical take off provided slightly longer hanging time in the air. This optimal airborne duration allowed the arm muscles to perform a more powerful whipping action and direct the ball toward the target area with a very high degree of precision.

In contrast, most students who remained in the Good category, such as Alan, Puddin, Ravi, and others, were limited by inadequate take off power and therefore had to rely primarily on instinct and arm strength to achieve accurate ball placement. The extracurricular training pattern implemented thus far appears to have successfully developed the automaticity of repetitive hitting movements but has not yet adequately addressed the specific physical conditioning required to improve jumping ability. Therefore, these findings reinforce that optimal smash performance cannot be achieved through a single component; rather, it represents an integrated interaction between physical fitness, particularly lower limb explosive power, and the development of kinesthetic maturity in judging distance, the direction and trajectory of the set ball, and the decision making involved in executing the attack.

Conclusions

Based on the research results, data processing, and discussion presented in the previous chapter, the following conclusion can be drawn: The overall smash ability of the male students participating in the volleyball extracurricular program at SMP Negeri 45 Martubung in 2026 falls into the Good category. This is evidenced by the highest frequency percentage, with 13 students (72.2%) classified in the Good category. Furthermore, 3 students (16.7%) fall into the Very Good category, while 2 students (11.1%) are in the Fair category. The mean score for the students' smash ability 29.17 further confirms that their performance level lies within the Good category range.

Acknowledgments

The author expresses gratitude to SMP Negeri 45 Martubung and the Bina Guna College of Sports and Health, as well as the researchers and authors who participated in and provided support for this research project.

Conflict of Interest

The authors declare no conflict of interest.

Funding

This research received no external funding.

References

Arikunto, S. (2020). Prosedur penelitian: Suatu pendekatan praktik. Jakarta: Rineka Cipta.

Bompa, T. O., & Buzzichelli, C. (2022). Periodization: Theory and methodology of training (6th ed.). Champaign, IL: Human Kinetics.

Diana, R., Prasetyo, A., & Kurniawan, M. (2025). Analysis of basic technical skills in volleyball smash. Journal of Physical Education and Sport Studies, 10(2), 115–123.

Hale, T., & Sanders, J. (2023). Volleyball fundamentals. Champaign, IL: Human Kinetics.

Kusuma, R., & Pratama, D. (2022). Evaluasi keterampilan teknik bola voli pada siswa sekolah menengah. Jurnal Pendidikan Jasmani Indonesia, 18(2), 85–94.

Mulyadi, Dwi Yulia Nur, & Endang Pratiwi. (2020). Pembelajaran Bola Voli. Palembang. Bening Media Publishing.

Putra, R., & Hidayat, T. (2023). Pengaruh latihan teknik terhadap kemampuan smash bola voli siswa sekolah menengah. Jurnal Prestasi Olahraga, 6(1), 45–52.

Putra, R., & Muhtarom, A. (2025). Efektivitas penggunaan media sasaran terhadap peningkatan keterampilan smash bola voli. Jurnal Pendidikan Olahraga Indonesia, 12(1), 23–31.

Putra, R., & Sugiyanto. (2023). Pengaruh penguasaan teknik dasar terhadap aktivitas bermain bola voli siswa SMP. Jurnal Keolahragaan Indonesia, 9(2), 101–109.

Rahman, F., & Pratama, R. (2023). Analisis kesulitan teknik smash pada siswa sekolah menengah pertama. Jurnal Pendidikan Jasmani dan Olahraga, 8(1), 67–75.

Rahmat, A., & Yulianto, F. (2021). Evaluasi teknik smash bola voli pada siswa sekolah menengah. Jurnal Pendidikan Jasmani Indonesia, 17(1), 55–63.

Sudjana. (2019). Metode statistika. Bandung: Tarsito.

Sugiyono. (2022). Metode penelitian kuantitatif, kualitatif, dan R&D. Bandung: Alfabeta.

Sujarwo, S., & Kuswoyo, H. (2025). Effects of plyometric training on volleyball smash performance. Journal of Sport Science and Physical Education, 10(1), 52–60.

Winarno, M. E. (2022). Evaluasi pembelajaran pendidikan jasmani dan olahraga.

Malang: Universitas Negeri Malang Press.