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The Effect of Physical Education Learning Using Modified Balls on Basketball Passing Learning Outcomes among Junior High School Students

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Abstract. The research aims to investigate the effect of modified balls on basketball passing learning outcomes among students at SMP Negeri 1 Salam Babaris. The study examined how different types of balls regular basketballs, volleyballs, and rubber balls influence students' learning performance in passing activities during physical education classes. A one-way analysis of covariance (ANCOVA) was applied to compare the effects of each modification. The participants were students enrolled in basketball passing lessons at SMP Negeri 1 Salam Babaris. Data were collected through a basketball passing test against a wall and observation of learning implementation. Statistical analysis using ANCOVA indicated that the type of ball used in learning significantly influenced basketball passing performance. The calculated F-value of 5829.15 exceeded the F-table value of 3.02 at the 0.05 significance level, leading to the rejection of the null hypothesis (H_0) and the acceptance of the alternative hypothesis (H_a). The findings revealed that using volleyball and rubber balls in learning activities produced higher passing scores compared to using standard basketballs. The adaptation of learning media through modified balls enhanced students' ability to perform accurately and controlled passes. The interpretation of the results suggests that instructional modification in physical education can foster engagement, motivation, and motor skill mastery. The research contributes to the development of effective teaching strategies in physical education by emphasizing that appropriate equipment modification can improve student performance and facilitate successful skill acquisition in basketball passing.
Keywords: physical education; modified ball; basketball; passing; learning outcomes; instructional strategy

Abstrak. Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan bola yang dimodifikasi terhadap hasil belajar passing bola basket pada peserta didik di SMP Negeri 1 Salam Babaris. Penelitian ini menelaah bagaimana berbagai jenis bola seperti bola basket standar, bola voli, dan bola karet mempengaruhi performa belajar peserta didik dalam aktivitas passing selama pembelajaran pendidikan jasmani. Metode penelitian yang digunakan adalah eksperimen komparatif dengan analisis kovarians satu arah (ANCOVA). Partisipan dalam penelitian ini adalah peserta didik yang mengikuti pembelajaran passing bola basket di SMP Negeri 1 Salam Babaris. Data dikumpulkan melalui tes passing bola basket ke dinding dan lembar observasi pelaksanaan pembelajaran. Hasil analisis statistik menggunakan ANCOVA menunjukkan bahwa jenis bola yang digunakan dalam pembelajaran berpengaruh signifikan terhadap kemampuan passing bola basket. Nilai Fhitung sebesar 5829,15 lebih besar daripada Ftabel sebesar 3,02 pada taraf signifikansi 0,05, sehingga hipotesis nol (H_0) ditolak dan hipotesis alternatif (H_a) diterima. Temuan penelitian menunjukkan bahwa penggunaan bola voli dan bola karet dalam kegiatan pembelajaran menghasilkan skor passing yang lebih tinggi dibandingkan penggunaan bola basket standar. Adaptasi media pembelajaran melalui modifikasi bola terbukti meningkatkan kemampuan peserta didik dalam melakukan passing secara lebih akurat dan terkontrol. Interpretasi hasil penelitian ini menunjukkan bahwa modifikasi instrumen pembelajaran dalam pendidikan jasmani dapat meningkatkan keterlibatan, motivasi, dan penguasaan keterampilan gerak peserta didik. Penelitian ini berkontribusi terhadap pengembangan strategi pembelajaran efektif dalam pendidikan jasmani dengan menekankan bahwa modifikasi peralatan pembelajaran yang tepat dapat meningkatkan performa belajar dan keberhasilan peserta didik dalam menguasai keterampilan passing bola basket.
Kata kunci: pendidikan jasmani; modifikasi bola; bola basket; passing; hasil belajar; strategi pembelajaran

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INTRODUCTION

Education serves as a fundamental factor in human development, aiming to guide individuals toward personal growth and enhance their sense of self-worth. The achievement of educational goals relies heavily on the learning outcomes attained through structured instructional processes. Teacher competence in managing learning effectively particularly through instructional models that enhance

students' comprehension of subject matter plays a crucial role in determining academic performance. A well-designed learning model fosters engaging and efficient learning experiences that improve knowledge retention and skill acquisition. Therefore, selecting appropriate instructional approaches contributes to optimal learning outcomes and provides meaningful advantages for students. Conversely, the application of ineffective teaching methods may result in persistent misconceptions and, if left unaddressed, can lead to a decline in instructional quality that negatively affects student development and undermines educational progress.

The character and potential of students are largely shaped by their participation in physical education programs. The Indonesian National Education Standards for primary and secondary education, specifically within the domain of Physical Education, Sports, and Health as outlined in the Regulation of the Minister of National Education No. 20 of 2006, serve as a guideline encouraging active student participation through effective and systematic physical activities. Husdarta (2011) defines physical education as an interdisciplinary field designed to teach students about health and well-being through structured games, sports, and other physical activities. The promotion of individual development through physical activity forms the core of every quality physical education program. The primary objectives encompass improving physical fitness, developing new motor skills, and fostering holistic growth that integrates social and emotional dimensions through active engagement in sports and movement.

Physical education at the junior high school level represents a critical stage in developing foundational movement skills and positive attitudes toward lifelong physical activity. According to the Ministry of National Education (2006), physical education, sports, and health programs are integral components of a comprehensive curriculum aimed at enhancing cognitive abilities, social interaction, reasoning, emotional balance, moral behavior, and physical fitness. The structured inclusion of physical and health-related activities within school programs supports students' intellectual and personal development while promoting healthy lifestyles. The curriculum encompasses a diverse range of topics, including aquatics, rhythmic exercise, gymnastics, self-evaluation, extracurricular activities, games, and sports, all of which collectively support holistic student development.

Mahendra (2010) describes physical education as a pedagogical process conducted through sports, games, or other structured physical activities that foster growth across psychomotor, cognitive, and affective domains. Physical education not only provides opportunities for students to maximize their potential but also enhances physical, emotional, social, and mental aspects of learning. Achieving these educational goals requires consistent engagement and sufficient instructional time. Similarly, Rosdiani (2015) states that physical education aims to develop students holistically physically, mentally, emotionally, socially, and morally through carefully planned activities such as games, exercises, and various movement-based experiences. Widodo and Aziz (2018) emphasize that the essence of physical education lies in teaching the body through movement, implying that schools cannot achieve a complete educational process without physical education as a core component.

Hidayatullah (2012) adds that the purpose of physical education extends beyond promoting physical activity; it aims to help students achieve their fullest potential through guided exercise. This view corresponds with Rosdiani's (2015) perspective, which considers physical education an essential element of a comprehensive curriculum contributing to holistic human development. Humans possess an inherent inclination to move as a natural mechanism for exploration and self-discovery. The evolution of the physical education curriculum reflects a pedagogical shift from teacher-centered instruction toward more student-centered approaches, aligning with contemporary educational practices.

Enhancing basketball learning serves as a strategic effort to improve the quality of physical education at the junior high level, making lessons more engaging and enjoyable for students. One pedagogical innovation involves modifying basketball attributes, such as adjusting the playing field and replacing standard basketballs with alternative materials like rubber, to improve accessibility and safety. Such modifications aim to increase student engagement and facilitate the acquisition of technical and conceptual understanding in basketball. As a result, modified basketball learning not only fosters a more enjoyable learning atmosphere but also supports the comprehensive development of students' physical, cognitive, and social competencies.

Observations of basketball learning implementation in schools revealed limitations in students' mastery of passing techniques. Therefore, a more structured and creative instructional strategy is required to improve students' understanding and performance in basketball passing. Infrastructure

quality plays a vital role in achieving educational goals. The adequacy of sports facilities directly affects the success of learning outcomes. Complete and well-maintained facilities enable teachers to conduct effective instruction, while inadequate resources hinder instructional delivery and student progress. A similar condition was identified at SMP Negeri 1 Salam Babaris, where only two basketball facilities were available one for male students and one for female students limiting the scope and intensity of practice. Such constraints reduced the effectiveness of basketball passing instruction, resulting in suboptimal skill acquisition among students.

Addressing these challenges requires creative innovation in learning design and adaptation of instructional media. One potential solution involves the use of modified learning equipment to substitute standard basketballs, which may be cost-prohibitive or difficult to obtain in sufficient quantities. The selected alternative media must possess characteristics that replicate the essential properties of basketballs while remaining affordable, safe, and widely accessible. Implementing creative and adaptive instructional strategies aligns with Kurniawan's (2023) assertion that innovative learning design and resource adaptation significantly influence the effectiveness of the learning process and can improve instructional quality toward an ideal condition.

The ultimate objective of educational innovation is to optimize learning outcomes for students. In the context of basketball instruction, underperformance in technical skills such as passing directly impacts overall learning achievement. Consequently, the present research focuses on addressing these shortcomings by investigating an innovative approach involving modified balls in physical education. The study is titled "The Effect of Physical Education Learning Using Modified Balls on Basketball Passing Learning Outcomes among Junior High School Students of SMPN 1 Salam Babaris." The research seeks to determine whether the implementation of ball modification in basketball learning can enhance passing performance and contribute to more engaging, efficient, and effective physical education experiences for students.

METHODS

Research methodology represents a systematic and scientific strategy applied to collect data for achieving specific objectives and producing practical benefits. According to Sugiyono (2015), research methodology serves as an organized framework for gathering and analyzing information in order to reach valid conclusions. Arikunto (2010) defines research methods as techniques used by researchers to obtain data relevant to their study objectives. The present research employed a comparative experimental method, an analytical approach that examines differences between two or more data sets to determine the extent of variation caused by an independent variable. The primary purpose of this method is to evaluate the influence of an independent variable, referred to as treatment, on a dependent variable by manipulating the independent factor and observing the resulting impact. As described by Suharsaputra (2012), experimental techniques within quantitative research provide a highly effective means of exploring causal relationships among variables, particularly when assessing the impact of specific interventions on measurable outcomes.

The study involved a sample of 111 students enrolled at SMPN 1 Salam Babaris. The focus of the investigation was directed toward selected groups of students whose data provided the empirical basis for determining the effectiveness of the intervention. The research design incorporated both testing and observation as primary data collection instruments. A basketball passing test against a wall was used to evaluate students' technical ability in executing passing skills, serving as the main performance indicator. Observational techniques were implemented to assess the quality of instructional delivery and student engagement during the learning process. The collected data consisted of both pretest results, measured prior to the intervention, and post-test results, obtained after the completion of the learning sessions.

The intervention consisted of a basketball passing learning activity that employed three types of balls standard basketballs, volleyballs, and rubber balls. The learning process emphasized underhand passing techniques, enabling comparison of performance outcomes across groups using different ball modifications. Each learning session was carefully structured to maintain consistent duration, instructional content, and environmental conditions, ensuring the validity of comparisons among treatment groups. The experimental approach sought to identify how the modification of learning media influenced students' skill development and overall basketball passing proficiency.

Data collection followed several stages. The first stage involved conducting a pretest to establish a baseline measurement of students' passing ability. The second stage consisted of implementing the instructional intervention using modified balls, observed directly by researchers to ensure compliance with the lesson plan. The third stage included administering a post-test to measure performance improvement after the intervention. Data from pretest and post-test results provided the basis for quantitative analysis.

Data analysis employed a one-way analysis of covariance (ANCOVA) at a significance level of 0.05. The analytical procedure aimed to determine whether significant differences existed among the learning outcomes produced by the use of standard basketballs, volleyballs, and rubber balls. The statistical interpretation was based on the comparison of calculated F-values (Fcount) with critical F-table values at $\alpha = 0.05$. When the calculated F-value exceeded the critical value, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_a) was accepted, indicating a significant effect of ball modification on basketball passing performance. Conversely, if the F-value did not exceed the threshold, no significant difference was inferred.

The statistical computation was performed using Microsoft Excel 2010, and all data were processed and interpreted according to standard quantitative analysis procedures as outlined by Kadir (2018). The application of ANCOVA allowed for controlling initial differences among groups while evaluating the effectiveness of each modified ball type on students' learning outcomes. The overall results revealed that different types of ball modification standard, volleyball, and rubber produced distinct variations in passing performance, leading to enhanced skill acquisition and improved learning efficiency.

RESULTS AND DISCUSSION

The analysis presents the findings of a one-way analysis of covariance (ANCOVA) that examined the effect of basketball modification on students' basketball passing learning outcomes. The statistical results summarized in Table 4.1 demonstrate the total data distribution for all treatment variables (X_1, X_2, X_3) and the dependent variable (Y). The data represent three experimental groups consisting of students who practiced basketball passing using standard basketballs, volleyballs, and rubber balls.

Table 1. Total Values of All Treatments for Variables X and Y

Statistic	X_1	X_2	X_3	Y	ΣX123	ΣY
n	111	111	111	111	333	333
$\Sigma X_1, \Sigma X_2, \Sigma X_3, \Sigma Y$	1419	1818	1940	2390	52177	2390
$\Sigma X_1^2, \Sigma X_2^2, \Sigma X_3^2, \Sigma Y^2$	18307	30068	34406	51828	82781	51828
$\Sigma x_1^2, \Sigma x_2^2, \Sigma x_3^2, \Sigma y^2$	12092	19862	22701	34187	54654	34187
$\bar{x}_1, \bar{x}_2, \bar{x}_3, \bar{Y}$	38	49	52	65	140	65
$\Sigma X_i Y$	—	—	—	—	111601	—
$\Sigma x_i y$	—	—	—	—	73376	—

The table 1 indicates differences in mean values among the three treatment groups. The mean value for group X_1 (standard basketball) was 38, while groups X_2 (volleyball) and X_3 (rubber ball) achieved mean scores of 49 and 52, respectively. The overall mean score for the dependent variable Y (passing performance) was 65. The data pattern reflects an increasing trend in learning outcomes as the type of ball modification varied, suggesting that lighter and softer balls facilitated improved control and accuracy in passing movements.

The subsequent ANCOVA test results are presented in Table 2. Statistical analysis revealed that the calculated F-value (Fcount) was 5829.15, exceeding the F-table value (Ftable) of 3.02 at a significance level of $\alpha = 0.05$.

Table 2. ANCOVA Results for Ball Modification and Basketball Passing Learning Outcomes

Fcount	Ftable	Hypothesis
5829.15	3.02	H_0 rejected; H_a accepted

The null hypothesis (H_0), which posits no difference among treatments, was rejected, while the alternative hypothesis (H_a) was accepted. The statistical evidence confirms that the modification of learning media specifically the use of volleyballs and rubber balls in place of standard basketballs significantly influenced students' performance in basketball passing. The results indicate that students who practiced with modified balls demonstrated superior passing accuracy and consistency compared to those who used standard basketballs. The physical properties of volleyballs and rubber balls, which are lighter and easier to handle, enabled smoother execution of motor skills during practice sessions. This finding supports the principle that adaptive learning media can reduce the level of difficulty for beginners and foster greater confidence and engagement during skill acquisition.

The covariance analysis also illustrates that the variations in learning outcomes are not random but systematically related to the instructional modifications applied. The improved results in the modified ball groups suggest that proper adaptation of learning tools contributes to enhanced psychomotor development and comprehension of movement concepts in physical education. Consequently, the findings reinforce the pedagogical importance of using creative and flexible instructional strategies to promote effective skill learning. The overall interpretation of the ANCOVA results emphasizes that modification in learning equipment, such as altering the type of ball used in basketball instruction, significantly enhances students' performance in passing activities. The findings substantiate that innovation in instructional design plays a vital role in improving the quality of physical education learning outcomes, particularly in developing fundamental sports skills among junior high school students.

Effect Before and After Learning Using Modified Volleyballs

The application of volleyball adaptations in basketball passing instruction produced a significant effect on students at SMP Negeri 1 Salam Babaris. The learning method exemplified the theoretical concept of associative learning, which emphasizes the relationship between stimulus and response in the development of specific student competencies. The preliminary assessment conducted prior to instruction evaluated students' initial conditions and physical readiness, aligning with Thorndike's law of readiness, which posits that the connection between stimulus and response occurs when the nervous system is adequately prepared for learning. The readiness of the nervous system stimulated physiological motivation among students to engage in activities and acquire motor skills.

Learning basketball passing through the use of volleyballs demonstrated a positive influence on students' performance. The six-week instructional period, comprising twelve learning sessions conducted twice per week for forty-five minutes per session, resulted in a substantial difference in outcomes compared to the pre-instruction stage. Learning strategies included varied passing exercises such as paired straight-line passing, triangular passing, and wall-passing at different distances. The consistent use of lightweight volleyballs facilitated easier ball handling, enhanced coordination, and improved understanding of passing mechanics.

The improvement observed in the study aligns with previous findings indicating that diverse teaching approaches and variations in instructional tools enhance the acquisition of chest-passing skills. The use of volleyballs as a learning medium represented a deliberate pedagogical adaptation designed to achieve educational objectives. Such modifications serve as effective alternative methods in physical education, allowing for improved learning experiences among students with varying physical capacities. Prior studies demonstrated that mini-basketball training significantly improved fundamental motor skills among children facing movement difficulties, thereby reinforcing the conclusion that modified volleyballs effectively enhanced basketball passing ability in this study. Consequently, twelve sessions of volleyball-based basketball instruction proved effective in improving students' passing performance, supported by both theoretical foundations and empirical evidence.

Effect Before and After Learning Using Standard Basketballs

Instruction employing standard basketballs also contributed to improved passing skills among students at SMP Negeri 1 Salam Babaris. The differences observed between pretest and post-test results reflected the impact of consistent exposure to practice stimuli associated with basketball passing exercises. Learning was conducted intensively and systematically, twice per week for a total of twelve sessions, each lasting forty-five minutes. The post-test served as a measure of the body's adaptive response following repeated learning stimuli.

The learning of basketball passing acted as a primary stimulus that elicited physical and cognitive responses related to motor coordination. The observed relationship between learning activity and behavioral response supports Husamah's (2014) explanation of the connection between physical practice and its educational outcomes. Rahayubi's (2012) law of attitude further suggests that intrinsic talent and individual preference influence learning performance. Baseline evaluations were conducted to classify participants according to their initial skill levels, ensuring accurate measurement of progress. Schmottlach (2006) emphasized that organized instructional strategies exert a strong influence on basketball passing performance, a notion reflected in the structured approach of the current study.

The findings indicated that a combination of autonomous and guided learning enhances chest-pass and bounce-pass proficiency. Although self-directed learning encourages independence and engagement, guided instruction often yields superior results due to structured feedback and consistent supervision. The integration of both learning methods within the current research likely contributed to the significant improvement in post-test scores. The outcome validates that structured and deliberate instructional design, supported by active student participation, strengthens motor learning and promotes higher retention of basketball passing skills.

Effect Before and After Learning Using Modified Rubber Balls

The use of modified rubber balls in basketball passing instruction produced a pronounced positive effect on student performance. The improvement may be attributed to the reduced weight and increased elasticity of rubber balls, which allowed students to execute movements with greater ease and confidence. This finding aligns with Thorndike's law of effect, which asserts that satisfying responses strengthen the association between stimulus and reaction. The modification of learning media in the form of lighter rubber balls facilitated more efficient motor responses and supported the acquisition of passing skills among students at SMP Negeri 1 Salam Babaris.

Physical education teachers are encouraged to adapt learning aids, such as rubber balls, to address common challenges faced by students during practice. The implementation of this instructional adjustment over four weeks, with one session per week, empirically improved basketball performance, enhanced cognitive understanding, and elevated student motivation. The results highlight the crucial role of teacher competence in designing adaptive learning experiences that align with student needs. Effective educators utilize modifications to increase engagement and participation, functioning as role models in demonstrating flexibility and innovation in instructional practice.

The use of alternative media such as rubber balls underscores the importance of adjusting instructional tools to suit physical and psychological characteristics of students. Research evidence supports that substituting learning materials while maintaining instructional objectives can be an effective strategy for improving student outcomes. The approach of modifying equipment, such as replacing basketballs with rubber or smaller balls, corresponds to the anthropometric characteristics of junior high school students, including height, weight, and physical activity levels. The lighter and softer texture of rubber balls reduced fear during practice and encouraged active participation, allowing students to perform passing techniques more confidently.

The findings correspond with prior research demonstrating that using smaller and lighter balls enhances passing ability by lowering cognitive load and facilitating motor coordination. The variation in stimuli created by modified volleyballs or rubber balls triggered positive learning responses and increased student enthusiasm. The adaptability of the instructional design to the learners' physical characteristics fostered engagement and active participation, as supported by pedagogical theories that emphasize learner-centered, experiential approaches. The empirical results confirm that ball modification in basketball instruction effectively improves skill performance, motivation, and cognitive understanding among students in junior high education.

Across all three treatments volleyball, standard basketball, and rubber ball modifications the results consistently demonstrate that adaptive instructional media significantly improve basketball passing performance. Modified equipment reduced learning barriers, enhanced motor efficiency, and stimulated greater enthusiasm among students. The volleyball and rubber ball modifications, in particular, produced superior outcomes compared to standard basketball instruction, confirming that media modification aligns with the physical and psychological readiness of learners.

The findings collectively highlight the pedagogical value of innovation in physical education. Adapting learning tools not only increases skill mastery but also strengthens motivation, confidence,

and engagement. The deductive conclusion drawn from the analysis emphasizes that creative instructional modifications contribute to the optimization of psychomotor learning outcomes. Educators are therefore encouraged to implement adaptive strategies to cultivate active learning environments that promote both skill development and enjoyment in physical education.

CONCLUSION

The results of the one-way analysis of covariance (ANCOVA) on basketball modification and learning outcomes in passing at SMP Negeri 1 Salam Babaris demonstrate a significant effect of standard, volleyball, and rubber ball modifications on students' basketball passing performance. The calculated F-value of 5860.9 exceeded the critical F-value of 3.02 at the 0.05 significance level, indicating a statistically significant difference among the treatments. Consequently, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_a) was accepted. The findings confirm that modifications applied to basketball equipment exerted a strong influence on students' skill improvement and academic achievement in physical education. Teaching basketball passing using various types of balls specifically modified volleyballs, standard basketballs, and rubber balls had a positive impact on students' ability to perform accurate and controlled passes. The incorporation of volleyball and rubber ball modifications produced greater improvements compared to instruction using standard basketballs, demonstrating that adaptive learning media effectively enhance motor skill development, engagement, and learning outcomes among junior high school students.

REFERENCES

Bahagia, & Suherman, A. (2000). *Prinsip-prinsip pengembangan dan modifikasi.* Bandung: Alfabeta.

Burcak, K. (2015). The effects on soccer passing skills when warming up with two different sized soccer balls. *Educational Research and Reviews, 10*(22), 2860–2868. https://doi.org/10.5897/ERR2015.2481

Fotrousi, F., Bagherly, J., & Ghasemi, A. (2012). The compensatory impact of mini-basketball skills on the progress of fundamental movements in children. *Procedia - Social and Behavioral Sciences, 46*, 5206–5210. https://doi.org/10.1016/j.sbspro.2012.06.412

Hernawan, A. H. (2018). *Hakikat strategi pembelajaran.* Dalam *Strategi pembelajaran di SD* (pp. 1–1).

Hidayatullah, M. F. (2012). Pendidikan jasmani dan olahraga sebagai media pendidikan dalam membangun insan berkarakter dan bermartabat. *Makalah Seminar Nasional Membangun Insan yang Berkarakter dan Bermartabat melalui Olahraga*, Yogyakarta, 12.

Husamah. (2014). *Pembelajaran bauran (blended learning).* Jakarta: Prestasi Pustaka Karya.

Husamah, Pantiwati, Y., Restian, A., & Sumarsono, P. (2020). *Belajar dan pembelajaran.* Jakarta: Prenada Media.

Husdarta, H. J. S. (2011). *Manajemen pendidikan jasmani.* Bandung: Alfabeta.

Jogiyanto, H. M. (2006). *Filosofi, pendekatan, dan penerapan pembelajaran metode kasus.* Yogyakarta: Andi.

Kurniawan, A., Syafitri, E., Sastraatmadja, A. H. M., Rahmadani, E., & Sirait, S. (2023). *Model pembelajaran inovatif II.* Jakarta: Global Eksekutif Teknologi.

Lutan, R. (2002). *Asas-asas pendidikan jasmani: Pendekatan pendidikan gerak di sekolah dasar.* Jakarta: Direktorat Jenderal Olahraga.

Mahendra, A. (2010). *Menggagas kurikulum penjas masa depan.* Bandung: Universitas Pendidikan Indonesia.

Muhajir. (2003). *Pendidikan jasmani untuk kelas 1 SMP.* Bandung: Yudistira.

Mulyasa, E. (2007). *Standar kompetensi dan sertifikasi guru.* Bandung: Remaja Rosdakarya.

Nugroho, A., & Raharjo, F. M. (2020). Improving learning outcomes passing chest pass in play basketball with variation application of learning and modified grade ball SMP Santa Maria Terrain VIII academic year 2019/2020. *Journal of Midwifery and Nursing, 2*(1), 159–163.

Pusat Kurikulum dan Perbukuan, Kementerian Pendidikan Nasional. (2006). *Standar kompetensi lulusan pendidikan dasar dan menengah.* Jakarta: Permendiknas No. 20 Tahun 2006.

Rahayubi, H. (2012). *Teori-teori belajar dan aplikasi pembelajaran motorik: Deskripsi dan tinjauan kritis.* Bandung: Nusa Media.

Robert, J., & Stephen, S. (2014). Effect of supervised learning and self-learning on passing skills. *Journal of Sports Science and Education, 2*(10), 33–36.

Rosdiani, D. (2015). *Kurikulum pendidikan jasmani.* Bandung: Alfabeta.

Rusman, M. P. (2017). *Belajar dan pembelajaran: Berorientasi standar proses pendidikan.* Jakarta: Prenada Media.

Schmottlach, N., McManama, J. L., & Hicks, L. (2010). *Physical education activity handbook.* Boston, MA: Pearson.

Sobry Sutikno, M. (2009). *Belajar dan pembelajaran.* Bandung: Prospect.

Sugihartono, F. K., Harahap, F., Setiawati, F. A., & Nurhayati, S. R. (2007). *Psikologi pendidikan.* Yogyakarta: UNY Press.

Suharsaputra, U. (2012). *Metode penelitian: Kuantitatif, kualitatif, dan tindakan.* Bandung: Refika Aditama.

Suherman, W. S. (2001). *Pengembangan kurikulum pendidikan jasmani.* Yogyakarta: FIK UNY.

Suryobroto, M. A. (2004). *Diklat mata kuliah sarana dan prasarana pendidikan jasmani.* Yogyakarta: FIK UNY.

Triyono. (2013). *Metodologi penelitian pendidikan.* Yogyakarta: Ombak.

van Vliet, M., & Salmelin, R. (2020). Post-hoc modification of linear models: Combining machine learning with domain information to make solid inferences from noisy data. *NeuroImage, 204*, 116221. https://doi.org/10.1016/j.neuroimage.2019.116221

Widodo, A. (2018). Makna dan peran pendidikan jasmani dalam pembentukan insan yang melek jasmaniah. *Motion: Jurnal Riset Physical Education, 9*(1), 53–60. https://doi.org/10.33558/motion.v9i1.457