15 (1) (2026) 240 - 246
Journal of Physical Education, Sport, Health and Recreations
https://journal.unnes.ac.id/journals/peshr

Development of a Volleyball Service Learning Model Through Game-Based Activities in Physical Education at Junior High School 5 Bengkulu

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Article History

Received January 2026
Accepted February 2026
Published Vol.15 No.(1) 2026

Keywords:
Physical Education;
Volleyball Service;
Game-Based Learning;
Instructional Model;
Junior Secondary School

Abstract

This research and development were based on a policy (R &D) aimed to produce a valid, practical, and effective Volleyball game base service learning model for Physical Education (PE) in Junior High School 5 Kota Bengkulu. The study used the ADDIE model (Analysis, Design, Development, Implementation and Evaluation as a design for Research and Development (R&D). Data collection techniques consisted of observation, interviews, and questionnaire surveys to obtain expert validation data and to assess the practicality of the developed product. Five prototype game-oriented volleyball service learning models were first developed depending on the students' characteristics, whereas the validation, refinement and operational results indicated that four of the models could be workplace-ready model, namely Target Zone Service Model, Service Relay Model, Hit and Cone Model and Service and Run Model. The validity by expert (a learning expert, a volleyball subject-matter professional and a media specialist) of the system showed that feasibility scores for three experts were in high 90.3%, 91.0% and 90.6% with results all falling into highly feasible. Restrained implementation proved the feasibility and favorability of the four models among teachers, as well as students' motivation for participating in activities. On the basis of these results, the game-based volleyball service learning model is regarded as feasible, acceptable and practicable, and may be an optional instructional strategy to improve volleyball service teaching in junior secondary Physical Education classes.

How to Cite

Apriani, A., & Lestari, H. (2026). Development of Bola Tepak Game Model for Physical Education (PE) Instruction at Madrasah Tswanawiyah 1 Palembang. Journal of Physical Education, Sport, Health and Recreation, 15 (1), 240-246.

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p-ISSN 2460-724X
e-ISSN 2252-6773

INTRODUCTION

Physical Education contributes to the all-round development of students which reflects a balance between physical, mental and social/ emotional development as outlined in the national educational goals. It is aimed at developing learners with sound health, intelligent and character based that could only be achieved through pedagogically well design instructional practices which fit in to the developmental needs of the learners.(Raibowo & Eko Nopiyanto, 2020). (Raibowo & Eko Nopiyanto, 2020). Physical Education, as a deliberately organized and planned teaching-learning process, contributes to the improvement of physical and psychomotor capacities as well as cognitive and affective domains by means of active and meaningful experiences. Through well-structured physical activities, it also creates fun learning environment as a place to foster student's involvement and growing (Darmawati et.al, 2017) (Bile, Tapo, & Desi, 2021).

To teach sports like volleyball is an essential part of Physical Education, strengthening school children's fitness, teaching them how to work in a team, and developing their sense of discipline and sportsmanship. Basic motor patterns that are the fundamental technical skills in the teaching of volleyball at all levels, could be described as coordinated movements of legs, body and arms. Of these skills the service technique is a particularly essential one since it starts the game and sets up what follows. The mastery of service constitutes one of the basic foundation for students so that they can participate well and comprehensively in a volleyball game (Marsiyem, 2018). The serve is successful if the ball is passed over the net and drops inside the opposing playing area, such that the opponent has an opportunity to touch or play the ball and return it in a maximum of three touches (a receiving player may not make two consecutive contacts). This genre of games are skill based, coordination and getting a command at the different moves has to be mastered in order to hold, return the ball properly in the opponent's area.(Arridh et.al, 2021) (Saputra et.al, 2022).

Observing from Junior High School 5 Bengkulu City, learning the basic techniques of issuing services in volleyball is done traditionally or conventionally by way of simple repetitive exercises without a variation. This situation causes low activity, students get bored easily and not motivated so that it lowers the ideal grip of service technique.Especially postural matters, we must stand a little bent forward in order to be able to hit the shuttle accurately. This suggests that there was a discrepancy between learning types and junior high school students who are usually active and eager to take on challenges. Hence, a solution in the case of innovation of learning model contextual, fun and gamification to improve student engagement in understanding the basic techniques of services effectively and meaningfully.

Game approach is a technique of teaching that uses play method to reach certain standards in leaming physical education (Handayani et.al. 2024) (Ritonga et.al, 2024). Games are not only serve as a game to play, but they also created to train student s motor, cognitif, and social skills (Utami et.al, 2023). The general movement skills of pupils can be influenced and the basic manipulative movement skills in sports including throwing, catching, or hitting are prerequisites to master serving technique in volleyball (Pertiwi et.al, 2018) (Lanos et.al, 2024) (Paulima et.al, 2024). As more of manipulation movement skills, service techniques are mastered by students better because body coordination, ball control and stroke direction precision generally could be perfectly shaped as a part of motor skill learning (Zhang et al., 2024) A game centered teaching method seems to be relevant for a better learning of Volleyball serving techniques and this through attractive and significant teaching experiences. It is developed to reinforce manipulative motor skills and encourage active engagement which suits to the developmental stage of junior secondary students. The novelty of this research lies in the integration of game-embedded tasks into volleyball service learning activities, enabling students to acquire technical proficiency through contextualized and enjoyable gameplay. Accordingly, this study aims to develop and validate a game-embedded volleyball service learning model to optimize technical skill development, student activity, and learning performance in Physical Education classes. Thus, there is the need for a game-embedded volleyball service learning model to maximize technical skill development, student activity and learning in PE.

METHODS

The ADDIE model was used to accomplish the project as it contributes a systematic approach for designing instruction, while also providing the creative flexibility that can minimize instructional materials creation (Branch, R. M., 2009). (Branch, R. M., 2009). The model ADDIE was selected because its characteristics are sys-

tematic and cyclical for developing, testing and assessing the products of learning. The research was conducted at Junior High School 5 Bengkulu City and took the development of game-based volleyball service learning model on Physical Education learners as its focus.

Research steps: (1) Analysis, conducted by observing the learning process, interviewing PE teachers and conducting a school context study to find out student learning needs and characteristics; (2) Design, including preparing model concept frameworks, game design plans, support media and evaluation instruments; (3) Development comprising prototype models and expert judgement to determine product feasibility; (4) Implementation in the form of limited trials with students of grade VIII (class 8), to find out the level of application of the model in the context of PE learning at this stage; and (5) Evaluation for improved models through formative evaluations during development as well as implementation stages.

The validity test at the Development stage was carried out through the involvement of three experts, namely learning experts, volleyball material experts, and learning media experts, to ensure the feasibility of the multidimensional model including pedagogical aspects, the substance of service engineering materials, and instructional media design. This multidimensional approach allows for comprehensive, objective, and consistent product quality assessment in accordance with the standards for the development of learning models in physical education.

The target of the research was students of Junior High School 5 Bengkulu City as the main users of the learning model, while the research subjects included PE students and teachers as implementers and evaluators of the model. The evaluation of the product is focused on the aspect of validity, which is assessed through expert judgment from the three experts, as well as practicality, which is assessed through the test of the acceptance of the model by teachers and students in the implementation process. Data collection techniques consisted of observation, interviews, and questionnaire surveys to obtain expert validation data and assess the practicality of the developed model. The data were analyzed descriptively using quantitative percentage scores for expert validation and descriptive qualitative analysis to interpret teachers' and students' responses.

RESULTS AND DISCUSSION

The purpose of this research was to create learning design of games clerk-like volleyball game on PE which suited with physical, motoric, social and emotional development by the students class VIII Junior High School 5 Kota Bengkulu. The research results were organized and structured systematically based on the ADDIE development model consisting of five stages.

Analysis

To identify the characteristics of junior high school students, such as technical ability of volleyball service and motor coordination, interest in sports activities, and students' tendency to participate in game-based learning were examined. This was revealed in interviews with PE teachers of Junior High School 5 Bengkulu City, the results show that PE learning is often performed but still less diverse in activities and student participation. Instruction usually concentrates on the basics of volleyball skills so that some students are not very active and not motivated. The volleyball service learning games have yet to be widely used and developed as a system of learning, although they may enhance student participation, technical skills, motor coordination, cooperation and motivation to learn. The instructor's call was for a structured, safe, and easily implementable game-based volleyball service learning model which would accommodate the nature of junior high school students' needs in order to increase instructional efficacy and promote development of character. The implications of these findings indicate that game-based learning model is highly required for the improvement of the quality of Physical Education (PE) at Junior High School 5 Kota Bengkulu

Furthermore, the phase of analysis is also related to study on some documents including syllabus, lesson plan and the teaching materials in from PE as well as data from a needs analysis that has been given to 30 students. The questionnaire showed a strong positive reaction to the game based volleyball service learning; interest of students, very high (93%); enjoyment in those activities which relating their studies with life quality improvement, high (90%) and need for more structured learning model (92%). Game-based activities also correlated with positive emotional and psychomotor outcomes, such as high motivation (89%), physical activity (88%), social cooperation (87%), and willingness to actively participate in every session (86%). Students also demonstrated enhanced confidence in their volleyball-serving abilities (82 percent) and a strong interest for continued game-based learning (80 percent). On the other hand, traditional PE class (wihtout using games) was found to be moderately considered boring (75%). Overall, the mean average score of 86.8% is in the high cat-

egory, which confirmed that game-based volleyball model of service learning for PE grade IX students of Junior High School 5 Kota Bengkulu are applicable and needed soon.

Design

At the design stage, researchers develop initial designs service learning models through volleyball game based on the analysis of student needs and the actual circumstances of conducting PE studying in Junior High School 5 Bengkulu City. The model architecture at this point is still conceptual and the proposed system has not been subjected to expert validation or field trials, therefore it is open for improvement at further stages of development. The developed volleyball service learning model and its description in terms of implementation, activity steps, and success indicators are presented within the section that follows. The base design is given in the **Table 1.**

Table 1. Initial Design of the Volleyball Service Learning Model

Learning Model	Description
Target Zone Service	Model 1
Service Relay	Model 2
Service Battle	Model 3
Service and Run	Model 4
Target Ladder Service	Model 5
Knock Down Target	Model 6
Service Circle	Model 7

The service learning model in volleyball used in this study was formulated according to the principles of Physical Education (PE) which are active, fun and contextualized by taking into account the characteristics of student at Junior High School 5 City Bengkulu. To maximize participation, games were used for learning; however, safety as well as equipment usage and activity intensity heterogeneity at all technical levels of the students were considered. There were originally seven learning models based on student characteristics. All models are still hypothetical and will be validated by experts in learning, subject matter, and media before they are further developed to be implemented in schools.

Development

Development The gamma test then modified the initial design of the volleyball service learning model generated at the design stage into a prototype, in which an object or activities would be calibrated over space and time carefully, adapted to its surrounding environment (Tapo et.al, 2021), and designed based on the characteristics of junior high school students. The design prototype is transposed into a learning object in the form of a guidebook, accompanied by visual illustrations and activity flows, communicative instructions.

Model and media validation is also carried out through expert evaluation for the conceptual, pedagogical, technical, and media aspect. The model's validation result indicated that the learning objectivity was appropriate, products of activity flow was clear and easy to implement, as well as could increase students' participation levels, motivation levels, students cooperation in team work,and sportsmanship. The average percentable of model Feasibility was 91.3% and the mean was 92%, both fell in very feasible category. Further expert recommendations induced small changes to visuals, activity descriptions, and clarifications of learning objectives that would leave them more operational upon application.

At this point, three of the seven models were decided as not feasible for further development, and four as feasible and applicable at the next stage. The assessment findings are displayed in the **Figure 1-Figure 4**.



Figure 1. Target Zone Service game.

"TARGET ZONE SERVICE" A game designed to help players improve their volleyball serving and targeting skills with more accuracy. The students are directed to aim the ball at specific target areas on the opponent's court. ServiceACC - Control and Accuracy Service TSP has developed a tool that supports the practice and training, with excellent service control precision Training … just as in the match!.

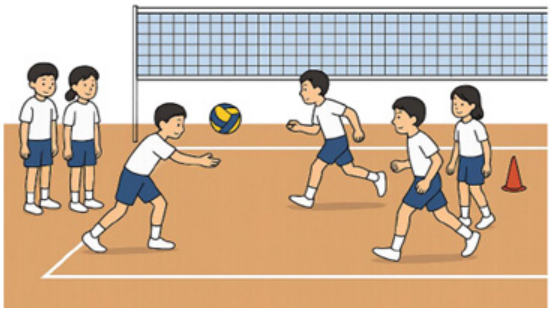


Figure 2. Service Relay game

This is a model in which the students serve volleyball to each other for serving relay as teams. The students take turns and then go to the end of the line. Speed, accuracy, consistency and working together are playing a big part in teaching students to keep prawn into practice.



Figure 3. Hit and Cone game

Where to Play Hit the Cone is a type of volleyball serving drill, where the aim is accuracy as opposed to power. STUDENTS HAVE: Involved the use of cone targets (small cones) or plastic bottles placed in an opponent's field area. Primary focus is to develop better skills for controlling the direction of ball during serving, while also training student's focus and attention. This game can be played as individuals or groups and in the form of competitive gameplay



Figure 4. Service and Run game

Service and Run is a practice drill for volleyball that puts serving skills in motion by turning it into a conditioning drill. In this play, students not only practice serving to the opponent's field, but also train for speed, coordination and endurance in running from the service line to a designated point on the court. This model provides a dynamical, competitive and enjoyable training environment.

Implementasi

The implementation was conducted in order to examine the relevance and effectiveness of game-based volleyball service learning model for the 8 grade students of Junior High School 5 Bengkulu. Four models, including Target Zone Service, Service Relay, Hit and Cone and Service and Run were assessed through observation sheets classified as "Applicable" or "Not Applicable". Results suggest that all models were located in the "Applicable" category and was well appreciated by teachers and students. Teachers found the models to be practical and feasible, and students were highly enthusiastic with active involvement. Furthermore, the intervention led to significant enhancements in service accuracy, ball control, coordination, speed, consistency and teamwork. These outcomes imply that the four models are practicable, efficient and with a good prospect as innovative strategies in PE, since they avoid the more traditional drill-based teaching procedures, and model skill appropriation along with student motivation, situational decision making and collaborative learning therefore supporting technical competences as well as social-affective dimensions (Hartati, 2023)

Evaluation

The implementation was conducted in order to examine the relevance and effectiveness of game-based volleyball service learning model for the 8 grade students of Junior High School 5 Bengkulu. Four models, including Target Zone Service, Service Relay, Hit and Cone and Service and Run were assessed through observation sheets classified as "Applicable" or "Not Applicable". Results suggest that all models were located in the "Applicable" category and was well appreciated by teachers and students. Teachers found the models to be practical and feasible, and students were highly enthusiastic with active involvement. Furthermore, the intervention led to significant enhancements in service accuracy, ball control, coordination, speed, consistency and teamwork (Atmoko et al., 2025). These outcomes imply that the four models are practicable, efficient and with a good prospect as innovative strategies in PE, since they avoid the more traditional drill-based teaching procedures, and model skill appropriation along with student motivation, situational decision making and collaborative learning

therefore supporting technical competences as well as social-affective dimensions.

The study conclude that the creation of four game-based volleyball service learning models (Target Zone Service, Service Relay, Hit and Cone, and Service and Run) can offer an alternative PE learning which is more contextual interesting as well as compliant with the characteristics of junior high school students. Statement of validation by learning experts, media experts and subject matter experts make the model as very much feasible in terms of pedagogy, technology and development suitability. Partial implementation proves the applicablity of all models and positive responses from PE's students and teachers towards them, especially in terms of involvement, motivation, and an active learning environment that is certainly fun.

Improvement in technical abilities of students occurs with better service accuracy, direction control, stroke consistency, movement adjustment and execution speed. Such results are supported by a study which demonstrates that sports engineering skills and motor skill aspects can be enhanced better than those of conventional exercise by game-based learning approach. (Utami et.al, 2023) (Abdillah, 2019) Furthermore, according to Hasyim (2025), a game is also assumed effective to fulfill students' psychological need for purposes: For instance, positive competition which means that students are competing in a healthy environment since they cooperate with others who have the same objectives in an effort to succeed and maintain success (Hasyim, 2025).

As such, each of these four models has relative advantages over traditional drill-based approaches to learning sport skills in that they focus on elements of the performance context (i.e., technical execution) but also include decision-making/game strategy/game-like contextual dynamics. These findings are in line with the model-based Approaches such as Game-Based Approach, TGfU (Teaching Games for Understanding), Sport Education Model are well known to improve technical, affective and social aspects of the students learning process at the same time (Ritonga et al., 2024)(Alexander et.al, 2018). Thereby, it is suggested that this game-based volleyAll service learning can be an alternative innovative PE strategy to more holistically listen the development of students' skill, motivation and learning participation.

CONCLUSION

Both the validation and feasibility results show that the game-based volleyball service learning model is practical, feasible for implementation in teaching junior secondary Physical Education. Experts' assessment affirmed the pedagogical clarity, relevance of material, and the model as media; few implementation trials revealed students learning with high motivation and engagement through positive experiences. While the model has not been subjected to an experimental effectiveness trial, there is preliminary evidence of gains in service skill performance, coordination and working-together behavior targets that are difficult for tradition drill-based instruction to reach at one time. Further studies are warranted to evaluate effectiveness, generalizability, and durability of learning gains within a wider array of school settings.

REFERENCES

Abdillah, A. (2019). Pengembangan Model Pembelajaran Motorik Berbasis Permainan. Jurnal Pendidikan Olahraga, 8(2), 138. https://doi.org/10.31571/jpo.v8i2.1446

Aldiwa Pandu Atmoko, Septyaning Lusianti, Muhammad Rofi'ussya'en, Dwi Atmoko, Para Watiningsih, & Bramanda Zein Atmoko. (2025). Pengaruh Modifikasi Bola terhadap Hasil Belajar Service Bawah Bola Voli pada Peserta Didik Kelas VII E di SMPN 7 Kediri. Jurnal Pengabdian Masyarakat Dan Riset Pendidikan, 3(4), 936–940. https://doi.org/10.31004/jerkin.v3i4.524

Alexander Gil-Arias alexander, Fernando Claver, and S. H. (2018). Autonomy support, motivational climate, enjoyment and perceived competence in physical education: Impact of a hybrid Teaching Games for Understanding/sport education unit. European Physical Education Review, 26(1). https://doi.org/https://doi.org/10.1177/1356336X18816997

Arridh, I. Q., Padli, Arwandi, J., & Yenes, R. (2021). Kondisi Fisik Pemain Sepak Bola. Jurnal Patriot, 3(March), 71–81. https://doi.org/10.24036/patriot.v

Bile, R. L., Tapo, Y. B. O., & Desi, A. K. (2021). Pengembangan Model Latihan Kebugaran Jasmani Berbasis Permainan Tradisional Sebagai Aktivitas Belajar Siswa Dalam Pembelajaran PJOK. Jurnal Penjakora, 8(1), 71. https://doi.org/10.23887/penjakora.v8i1.30752

Branch, R. M., & V. i. (2009). Instructional Design The ADDIE Aprproach. New York: Spinger. Retrieved from https://link.springer.com/

book/10.1007/978-0-387-09506-6

Chaeril Saputra1 , Ferri Hidayad2, J. G. M. 3. (2022). Pengembangan Metode Pembelajaran Servis Bawah Permainan Bola Volly Siswa Kelas V SDN 15 Sembawa. Jurnal Pendidikan Dan Konseling, 4(23), 12209–12217.

Darmawati, D., Tandiyo, Rahayu, A. R., & R.C. (2017). Leadership Guru Pendidikan Jasmani Olahraga dan Kesehatan di SMP Ogan Komering Ulu Timur Sumatera Selatan. Journal of Physical Education and Sports, 6(2), 108–116. Retrieved from https://journal.unnes.ac.id/sju/index.php/jpes/article/view/17359

Handayani, W., Cintami, M. El, & Lestari, H. (2024). Impact of Hadang and Bentengan Game on Students ' Physical Fitness Levels. 16, 3160–3169. https://doi.org/10.35445/alishlah.v16i3.5734

Hartati, S. C. Y. (2023). Pelatihan Penerapan Permainan Kecil Untuk Pembentukan Nilai-Nilai Karakter Dalam Pembelajaran Pjok Di Mgmp Pjok Sma Kabupaten Mojokerto. Laksana Olahraga, 01(01), 33–46. Retrieved from https://ejournal.unesa.ac.id/index.php/laksanaolahraga/article/view/50921%0Ahttps://ejournal.unesa.ac.id/index.php/laksanaolahraga/article/download/50921/41888

Hasyim1, F. L. (2025). Pendekatan Deep Learning Dalam Pembelajaran PJOK Di Sekolah. Jurnal Dunia Pendidik, 6(4), 1973–1987.

Marsiyem, M., Destriana, D., & Pratama, R. R. (2018). Pengembangan Model Pembelajaran Servis Bawah Permainan Bola Voli. Sebatik, 22(2), 161–166. https://doi.org/10.46984/sebatik.v22i2.323

Muhsana El CIntami Lanos, Widya Handayani, Jujur Gunawan Manullang, Anes Winartiningsih, R. F. (2024). Development of interactive manipulative motion learning media using adobe animate for elementary school students. Jurnal Keolahragaan, 12(2), 184–194.

Paulima, S. O., Fachrezzy, F., & Subandi, O. U. (2024). Manipulative basic Movement Learning Model in Class 6 Primary School Students. Kinestetik : Jurnal Ilmiah Pendidikan Jasmani, 8(1), 30–38.

Pertiwi, R. M., Nurhasan, N., & Syam, T. A. R. (2018). Pengembangan Model Pembelajaran Sirkuit Untuk Membantu Pola Gerak Lokomotor, Non Lokomotor, dan Manipulatif Anak Down Syndrome. Jendela Olahraga, 3(2), 26–36. https://doi.org/10.26877/jo.v3i2.2452

Raibowo, S., & Eko Nopiyanto, Y. (2020). Evaluasi Pembelajaran Pendidikan Jasmani Olahraga & Kesehatan pada SMP Negeri Se-Kabupaten Mukomuko melalui Pendekatan Model Context, Input, Process & Product (CIPP). Jurnal Pendidikan Kesehatan Rekreasi, 6(2), 146–165.

Ritonga, I., Gusril, G., Kiram, Y., Lanos, M. E. C., & Festiawan, R. (2024). Designing an innovative learning model for fundamental throwing and catching skills using the teaching games for understanding (tgfu) approach in elementary education. Retos, 61, 448–454. https://doi.org/10.47197/retos.v61.108823

Utami, R. F., & Arifin, B. (2023). Pembelajaran PJOK Berbasis Permainan: Meningkatkan Keterlibatan dan Hasil Belajar Siswa. Jurnal Pendidikan Jasmani Dan Kesehatan, 10(3), 77–85.

Yohanes Bayo Ola Tapo, Robertus Lili Bile, A. N. (2021). Pengembangan Model Latihan Spat-Desain Materi Bola Voli Dalam Pembelajaran Pjok Pada Jenjang SMP. Jurnal Penjakora, 8(April), 16–25. https://doi.org/https://doi.org/10.37742/jmpo.v6i2.172

Zhang, D., Soh, K. G., Chan, Y. M., Feng, X., Bashir, M., & Xiao, W. (2024). Effect of functional training on fundamental motor skills among children: A systematic review. Heliyon, 10(23). https://doi.org/10.1016/j.heliyon.2024.e39531.