COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 ‖ Volume 18, Number 1, 2026 ‖ P.0416-0426

Development of A Basic Service Technique Training Model Using The Head In Teqball Games For PJKR Students

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ABSTRACT

This study aimed to develop a basic service technique training model using the head in Teqball games for students of the Physical Education, Health, and Recreation (PJKR) Study Program. The research was motivated by the limited availability of structured and systematic training models that specifically address head-based serving skills in Teqball, particularly for beginner-level learners in higher education. The study employed a Research and Development (R&D) approach using the Borg and Gall model, which involved stages of needs analysis, planning, initial product development, expert validation, small-group trials, large-group trials, and product revision. The research subjects consisted of 15 PJKR students in the small-group trial and 20 PJKR students in the large-group trial. Data were collected through questionnaires distributed to learning experts, Teqball experts, and students, supported by observation and documentation. Data analysis was conducted using qualitative descriptive analysis to interpret expert feedback and quantitative descriptive analysis to determine feasibility levels based on percentage scores. The results showed that the developed training model obtained feasibility scores of 71% from learning experts, 71% from Teqball I experts, and 65% from Teqball II experts, all categorized as fairly feasible. Furthermore, the results of the small- and large-group trials demonstrated feasibility percentages ranging from 63% to 83%, indicating that the training model was understandable, practical, and beneficial. These findings confirm that the developed head-service training model is feasible for implementation and can serve as an alternative training model to improve basic Teqball service skills among PJKR students.

ARTICLE HISTORY
Received: 2025/12/18
Accepted: 2026/02/02
Published: 2026/02/08

KEYWORDS
Teqball;
Head Service Technique;
Training Model Development;
Research and Development;
Physical Education Students.

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 : Arya, A.; Saparia, A.; Rejeki, H.S.; Sardiman, S. (2026). Development of A Basic Service Technique Training Model Using The Head In Teqball Games For PJKR Students. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 18 (1), p.0416-0426

INTRODUCTION

Sport is a physical and mental activity that plays a strategic role in maintaining health, developing character, and improving the quality of human resources. Conceptually, sport is understood as a planned, structured, and controlled activity involving body movement to achieve health, education, recreation, and achievement goals (Ferianto et al., 2020; Safitri et al., 2024). In the context of national development, sport has a multidimensional role education, recreation, and achievement that demands

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continuous development in terms of policy, coaching, and learning innovation (Zulyaden & Dewi, 2022; Dwi Handoko, 2021).

The development of contemporary sport is marked by the emergence of new disciplines that adapt to social and technological dynamics. One rapidly growing discipline is Teqball, a soccer-based sport originating from Hungary and introduced globally in 2014 (Syahban, 2023). Teqball is played without the use of hands and requires high levels of coordination, ball control, and technical precision. In Indonesia, Teqball is gaining widespread recognition and has the potential to become an alternative educational and competitive sport, particularly in physical education and coaching settings (Sianto, 2025).

However, in the practice of Teqball instruction in higher education—particularly among Physical Education, Health, and Recreation (PJKR) students—fundamental problems have been found in mastering serving techniques, particularly using the head as the initial movement. The serve is a crucial determinant because it affects the rhythm of the game, initial control, and point scoring opportunities (Sardiman, 2024). Various studies report that beginner students experience technical and coordination difficulties in executing serves consistently and effectively due to the limitations of systematic and progressive training models (Setyawan, 2019; Putra et al., 2023). This situation highlights the urgency of developing training models that are appropriate to the characteristics of beginners and the context of higher education.

Research on technical skill development in new sports, including Teqball, generally emphasizes progressive training approaches, integration of physical conditioning, and game-based learning (Emral, 2020; Kurniawan, 2015). Empirical studies in soccer and related sports show that mastery of basic techniques—including serves and kick-offs—is influenced by muscle strength, coordination, balance, and an understanding of movement biomechanics (Bompa & Buzzichelli, 2019; Turner, 2015).

In the context of Teqball, several international studies have begun to examine aspects of performance, coordination, and technical adaptation to Teqball's distinctive curved table (Borsányi et al., 2018; Müller et al., 2021). Meanwhile, national research remains limited to descriptions of the sport and an introduction to basic techniques, with minimal development of specific training models based on student needs (Syahban, 2023; Sianto, 2025). A Research and Development (R&D) approach is recommended to produce valid, practical, and effective training products, especially in the context of physical education and sports coaching (Gall et al., 2014; Sugiyono, 2022).

Although the literature demonstrates the importance of service technique training and a progressive approach in soccer-based sports, a significant research gap remains in the development of a structured, systematic, and contextualized Teqball head serve training model for PJKR students. Most studies have not specifically integrated physical conditioning components (endurance, strength, coordination) with head serve technique in a single, empirically tested training model (Putra et al., 2023; Turner, 2015). Furthermore, a student needs analysis revealed that while 35% expressed a strong need for training model development, the remaining 65% were not optimally facilitated by existing learning approaches, indicating a gap between actual needs and practical learning.

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Based on these issues and gaps, this study aims to develop a basic head serve training model in Teqball specifically designed for PJKR students through an R&D approach. This model is structured progressively, starting from mastery of basic movements to game simulation, and integrates key physical conditioning components to improve serve effectiveness and consistency.

The novelty of this research lies in: (1) the development of the first contextual Teqball head serve training model for PJKR students in Indonesia; (2) the integration of service techniques with physical condition components in one holistic training design; and (3) the strategic contribution in strengthening Teqball as an alternative educational and achievement sport in higher education environments. Thus, this research is expected to not only improve students' technical competence, but also broaden the basis for the academic and practical development of Teqball in Indonesia.

METHODS

This study employed a Research and Development (R&D) approach, adopting the Borg and Gall development model, widely used in sports education and coaching product development due to its systematic, iterative, and empirical evaluation-based nature (Borg & Gall, 2014; Rohmaini et al., 2020). The R&D approach was chosen because the primary objective of this study was to develop a valid, practical, and effective training model for basic head serves in Teqball for Physical Education, Health, and Recreation (PJKR) students.

The Borg and Gall model consists of ten interrelated development stages, starting with needs analysis and continuing through product dissemination. In the first stage, a needs analysis was conducted through field observations, interviews, and questionnaires distributed to PJKR students to identify learning challenges and technical difficulties in performing Teqball head serves. This needs analysis is crucial to ensure that the product developed is relevant to student characteristics and the learning context (Gall et al., 2014; Sugiyono, 2022).

The second and third stages involved initial product planning and development, including formulating training objectives, developing a progressive training sequence, and designing a preliminary head serve training model based on biomechanical principles, coordination, and supporting physical conditions. This stage also included the development of supporting tools in the form of a training guide and a service skill evaluation instrument, as recommended in the development of sports training models (Bompa & Buzzichelli, 2019; Emral, 2020).

The fourth stage was a preliminary field trial conducted on a small scale to assess the clarity of instructions, movement feasibility, and initial participant responses. Data was obtained through a rating scale questionnaire and limited interviews. The fifth and sixth stages then included revisions to the main product and the main field trial, utilizing quantitative and qualitative data as a basis for refining the training model (Rahmatin, 2025).

The seventh through ninth stages included operational revisions, operational field trials, and final product revisions, aimed at ensuring the training model's consistency, effectiveness, and applicability in real-life learning contexts. The tenth stage is

dissemination and implementation, where the final product is socialized as an alternative model for basic Teqball technique training within the PJKR environment.

The study population was PJKR students, with a sample size of 15 students in the small-scale trial and 20 students in the large-scale trial, selected purposively based on their active involvement in Teqball learning. Data collection instruments included a rating scale questionnaire, observation sheets, and documentation. Data analysis used qualitative descriptive analysis to interpret expert input and suggestions, and quantitative descriptive analysis to assess the feasibility and effectiveness of the training model (Sardiman, 2024). This analytical approach allowed for a comprehensive evaluation of the quality of the product, both empirically and conceptually developed.

Table 1.
Presentation classification

No	Percentage	Classification	Meaning
1	80%-100%	80%-100%	Used
2	60%-79%	60%-79%	Used
3	50%-59%	50%-59%	Replaced
4	<50%	<50%	Replaced

RESULTS AND DISCUSSION

Result

The results of this development research are oriented towards the R&D (Research and Development) model from Borg and Gall which consists of 10 research stages. The researcher used a data collection method through a questionnaire to obtain data for the trials of stages I and II, namely (1) the trial of stage I involving 15 students, (2) the trial of stage II involving 20 PJKR students. In addition, an evaluation was also carried out by filling out a questionnaire by two experts, namely (1) one learning expert, and (2) two Teqball experts. In developing this service technique training model, the method applied to process research data from education experts and Teqball experts as well as the UNTAD PJKR Study Program is the percentage technique..

Table 2.
Results of Learning Expert Data Analysis

No.	Aspect	Eligibility	Category
1	Correct sentence writing according to Eyd	75%	Used
2	The language used is clear and easy to understand.	100%	Used
3	Accuracy of selection of materials used for the guide	100%	Used
4.	Sentences represent the content of the message or information you want to convey.	75%	Used
5.	Use of terms that are appropriate to the main concepts of the main topic	75%	Used
6	The content of the material presents a complete structure of parts.	100%	Used
7	The material for selecting interesting and non-monotonous exercise variations	75%	Used
8	The sentences used are simple and straight to the point.	100%	Used
9	The selection of material titles in the book is easy to understand	75%	Used
10	Examples of variation movements in the material in the book are very clear.	75%	Used
11	The truth of the content of the material arranged in sentences	75%	Used
	Average	**71%**	**Quite Decent**

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Based on the analysis conducted by experts in the field of learning, we reached the conclusion that the product of developing the service technique using the head in the game of teqball got a percentage of 71% and was declared quite feasible.

Table 3.
Teqball Expert Data Analysis Results I

No	Aspect	Eligibility	Category
1	Is the variation of the training model in image 1 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
2	Is the variation of the training model in image 2 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
3	Is the variation of the training model in image 3 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
4	Is the variation of the training model in Figure 4 suitable for use during training to improve the basic technique of serving using the head in Teqball?	50%	Replaced
5	Is the variation of the training model in Figure 5 suitable for use during training to improve the basic technical skills of serving using the head in Teqball?	100%	Used
6	Is the variation of the training model in Figure 6 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
7	Is the variation of the training model in Figure 7 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
8	Is the variation of the figure 8 training model suitable for use during training to improve basic service techniques using the head in Teqball?	100%	Used
9	Is the variation of the training model in Figure 9 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
10	Is the variation of the training model in Figure 10 suitable for use during training to improve the basic technique of serving using the head in Teqball?	75%	Used
	Average	**71%**	**Quite Decent**

Based on the results of the data analysis by Teqball Expert I, the product of developing a basic service technique training model using the head in the Teqball game received a percentage of 71% and was declared quite feasible.

Table 4.
Teqball II Expert Data Analysis Results

No	Aspect	Eligibility	Category
1	Is the variation of the training model in image 1 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
2	Is the variation of the training model in image 2 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
3	Is the variation of the training model in image 3 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used

4	Is the variation of the training model in Figure 4 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
5	Is the variation of the training model in Figure 5 suitable for use during training to improve the basic technical skills of serving using the head in Teqball?	25%	Replaced
6	Is the variation of the training model in Figure 6 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
7	Is the variation of the training model in Figure 7 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
8	Is the variation of the figure 8 training model suitable for use during training to improve basic service techniques using the head in Teqball?	100%	Used
9	Is the variation of the training model in Figure 9 suitable for use during training to improve the basic technique of serving using the head in Teqball?	100%	Used
10	Is the variation of the training model in Figure 10 suitable for use during training to improve the basic technique of serving using the head in Teqball?	25%	Replaced
	Average	**65%**	**Quite Decent**

Based on the results of the analysis of Teqball II expert data, it was concluded that the product of developing a basic service technique training model using the head in the Teqball game obtained a percentage of 65% and was declared quite feasible.

Table 5.
Data from the analysis of small group trials (small scale)

No	Aspect	Criteria
1	In your opinion, how do you do the Serve exercise using your head against the wall?	77% (Used)
2	In your opinion, how do you carry out the serve exercise using your head against the wall?	70% (Used)
3	Do you think the head-to-wall serve drills you've been doing are useful in Teqball?	65% (Used)
4	In your opinion, how was the service training with the target number that you have done?	68% (Used)
5	In your opinion, how do you carry out the service training with the target numbers that you have carried out?	70% (Used)
6	In your opinion, is the target number service practice that you have done useful in the game of Teqball?	63% (Used)
7	In your opinion, how do you practice serving using your head on the target that you have done?	75% (Used)
8	In your opinion, how does the p serve exercise using your head hit the target that you have done?	68% (Used)
9	In your opinion, is the practice of serving using your head to hit the target that you have been doing useful in the game of Teqball?	83% (Used)
10	What do you think about the different ball service drills you have done?	68% (Used)
11	In your opinion, how do you think the execution of the service practice with different balls that you have done?	70% (Used)
12	Do you think the different ball serving drills you have been doing are useful in Teqball?	83% (Used)
13	What do you think about the different angled serve drills you've been doing?	70% (Used)

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14	In your opinion, how do you think the execution of the service practice with different angles that you have done?	70% (Used)
15	Do you think the different angled serve drills you've been doing are useful in Teqball?	72% (Used)
16	In your opinion, how do you practice serving using your head with a target determined by your partner that you have done?	70% (Used)
17	In your opinion, how do you carry out the practice of serving using the head with the target determined by your partner that you have done?	83% (Used)
18	In your opinion, are the practice of serving using your head with targets determined by your partner that you have done useful in the game of Teqball?	83% (Used)
19	In your opinion, how did the service game practice with friends that your partner determined that you did?	73% (Used)
20	In your opinion, how did you go about implementing the service game practice with your friends?	77% (Used)
21	Do you think the service game drills you have been doing with friends are useful in playing Teqball?	72% (Used)

Based on the results of small group trials, questions regarding the form, implementation, and benefits of head serve training in teqball games showed that there were (7) variations of training in the used category. The percentage of assessments on the aspects of how the training was carried out, how the training was carried out, and whether the training was beneficial was in the range of 63%–83%. These results indicate that respondents assessed head serve training, whether against a wall, with a number target, a specific target, different balls and angles, or a target determined by a partner, as being quite good, feasible, and beneficial in teqball games. Therefore, the developed training model is suitable for use in the teqball service training process.

Table 6.
Data from the analysis

No	Aspect	Criteria
1	In your opinion, how do you do the Serve exercise using your head against the wall?	65% (Used)
2	In your opinion, how do you carry out the serve exercise using your head against the wall?	70% (Used)
3	Do you think the head-to-wall serve drills you've been doing are useful in Teqball?	78% (Used)
4	In your opinion, how do you practice serving using your head on the target that you have done?	63% (Used)
5	In your opinion, how do you carry out the Serving exercise using your head to hit the target that you have done?	77% (Used)
6	In your opinion, is the practice of serving using your head to hit the target that you have been doing useful in the game of Teqball?	83% (Used)
7	What do you think about the different angled serve drills you've been doing?	75% (Used)
8	In your opinion, how do you think the service execution with different angles that you have done?	68% (Used)
9	Do you think the different angled serve drills you've been doing are useful in Teqball?	83% (Used)
10	What do you think about the service game practice with friends that you have done?	72% (Used)
11	In your opinion, how did you play the service game with your friends?	83% (Used)
12	Do you think the service game practice you have done with friends is useful in Teqball?	75% (Used)

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The analysis results show that all assessment indicators are in the used category, with assessment percentages ranging from 63% to 83%. Head-to-wall service training achieved 65%–78%, head-to-target service training achieved 63%–83%, different-angle service training achieved 68%–83%, and partner service training achieved 72%–83%. These results indicate that the training model is easy to understand, can be implemented well, and provides benefits in improving service skills in Teqball games.

Based on the results of large-scale trials, it can be concluded that the head-based service training model in teqball games is feasible to use and can be recommended as an alternative training model at the Teqball learning and training stage according to the Borg and Gall development procedure.

Discussion

The results of this study indicate that the development of a training model for basic head serves in Teqball for PJKR students has a sufficient level of feasibility and applicability for use in the learning and training process. These findings confirm that the Research and Development (R&D) approach using the Borg and Gall model is effective in producing training products relevant to user needs, particularly in the context of a new sport with limited pedagogical references, such as Teqball (Gall et al., 2014; Sugiyono, 2022).

The evaluation by learning experts, which showed a feasibility level of 71%, indicates that the language, clarity of instructions, systematic presentation of the material, and appropriateness of the training method met the basic criteria for a suitable training resource. Theoretically, clarity of language and material structure are key prerequisites for learning motor skills, as they directly influence cognitive understanding and accuracy of movement execution (Magill & Anderson, 2017; Schmidt et al., 2019). These findings align with the principles of training model development, which emphasize the appropriateness of content to student characteristics and learning objectives (Bompa & Buzzichelli, 2019).

The assessments from Teqball I and II experts, which were in the "fair" category (71% and 65%), indicated that technically, the developed training variations reflected the characteristics of the head serve movement in Teqball. Although some training variations still needed revision, this feedback strengthened the content validity of the developed model. The literature indicates that the involvement of sport experts in the validation process is crucial for ensuring the safety, effectiveness, and biomechanical suitability of the training movements (Turner, 2015; McLean et al., 2020). In the context of Teqball, the head serve demands visual-motor coordination, neck and trunk control, and ball direction accuracy, so the training design must accurately reflect the specific motor demands of the sport (Müller et al., 2021).

The results of a small group trial showed that seven variations of the head serve exercise received scores between 63% and 83%, with the categories used. These findings indicate that simple, gradual, and varied training—such as serving against a wall, serving with a target, and game-based training—can increase student understanding and

interest. Empirically, a varied and contextualized training approach has been shown to increase intrinsic motivation, active engagement, and the quality of motor skill learning (Ntoumanis et al., 2017; Renshaw et al., 2019). This is particularly relevant for PJKR students who are in the basic technique learning phase and require engaging and challenging training stimuli.

The findings from the large-group trial corroborated previous results, with all assessment indicators falling within the 63%–83% range and categorized as applicable. This increased applicability indicates that revisions based on expert input and initial trials successfully refined the training model, making it easier to understand and apply. From a motor learning perspective, a progressive training model structured from simple to complex levels has been shown to be effective in improving coordination, accuracy, and motor control (Schmidt et al., 2019; Emral, 2020). In the context of Teqball, this directly contributes to improving the quality of the head serve, which is the initial movement of the game that determines the rhythm and effectiveness of playing strategy.

Overall, the results of this study support the theory that a systematically developed training model, based on user needs, and validated through empirical stages can enhance the effectiveness of the training process. The developed Teqball head serve training model meets the main principles of Borg and Gall: needs analysis, expert validation, gradual field trials, and continuous improvement. Therefore, this model is not only feasible to use but also has the potential to serve as an initial reference for developing Teqball learning and training for PJKR students, particularly during the basic technique mastery phase. In addition, these findings enrich the scientific knowledge of sports coaching by presenting a specific training model for new sports that continue to develop in Indonesia.

CONCLUSION

Based on the results of the research and development conducted, it can be concluded that the basic head serve technique training model in Teqball for PJKR students was successfully developed systematically through a Research and Development (R&D) approach using the Borg and Gall model. The development process went through essential stages, including needs analysis, product design, expert validation, small group trials, and large group trials, all of which ensured the relevance and applicability of the resulting training model.

Empirically, the evaluation results demonstrated an adequate level of feasibility, with a learning expert assessment of 71% and Teqball I and II expert assessments of 71% and 65%, respectively, in the "fair" category. These findings confirm that, in terms of material substance, exercise variations, and technical suitability to the characteristics of Teqball, the developed training model meets basic standards for use, although it still requires minor refinement based on expert input.

Furthermore, the results of the small and large group trials showed that all variations of the head serve training received scores between 63% and 83%, and were

deemed easy to understand, effectively implementable, and beneficial in improving students' head serve skills. Thus, this training model is worthy of being recommended as an alternative training model for basic Teqball service techniques for PJKR students and has the potential to become an initial reference in developing Teqball learning in higher education.

ACKNOWLEDGEMENTS

The author expresses his deepest appreciation and gratitude to all parties who have contributed conceptually, technically, and empirically to the implementation of this research. Special thanks are extended to the learning experts and Teqball experts who provided input, constructive criticism, and scientific validation of the developed training model, ensuring that the resulting product has a strong theoretical foundation and is suitable for practical application.

The author also thanks the students of the Physical Education, Health, and Recreation (PJKR) Study Program who actively participated as research subjects in both small and large group trials. Their participation provided crucial empirical contributions in evaluating the applicability, clarity, and effectiveness of the developed Teqball head serve training model.

Appreciation is also extended to the institution and study program administrators who provided administrative support, facilities, and a conducive academic environment, enabling this research to be carried out systematically and sustainably. Furthermore, the author thanks all parties who directly and indirectly supported the research process, from the planning stage to the refinement of the final product.

Finally, the author hopes that the results of this research can provide a real contribution to the development of sports coaching science, especially in Teqball learning and training in higher education environments.

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