

Validity test of a mobile learning-based circuit training model for football players

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ABSTRACT

This study aimed to examine the validity of a mobile learning-based circuit training model for football players. A development approach consisting of three main stages: needs analysis, model development, and validation, was employed. The study included 50 students (41 males and 9 females) aged 19–23 years ($M = 20$ years) enrolled in a football course at the Faculty of Sports and Health, Universitas Pendidikan Ganesha. Data were collected through expert evaluations and participant feedback and analyzed using descriptive statistics. The needs analysis revealed a demand for innovative training models integrating technology to address the limitations of traditional methods, such as monotony and lack of flexibility in evaluation time. The developed model was validated by three experts in sports training, educational technology, and evaluation, achieving an average validity score of 4.74, classified as very valid. Participants reported that the model was user-friendly, effective, and aligned with their training needs. The implementation of this model also demonstrated significant potential in enhancing participant engagement during training sessions. These findings confirm that the proposed model is valid and represents a promising alternative to traditional training methods. Furthermore, the model contributes to the development of technology-based sports training that is flexible and engaging, supporting coaches and players in achieving their training objectives more efficiently.

KEYWORDS

Circuit Training; Mobile Learning; Validity; Football Training

1. INTRODUCTION

In recent decades, technological advancements have brought significant changes to various aspects of life, including education and sports training. The integration of technology, particularly mobile learning, has become an increasingly popular approach to enhance the efficiency and effectiveness of learning (Hita et al., 2021). Mobile learning is defined as a learning model that involves mobile devices, enabling learners to access materials without spatial and temporal limitations (Criollo-C et al., 2021).

In the context of sports, the application of mobile learning offers opportunities to deliver training materials in a flexible, interactive, and easily accessible manner. Football, as one of the most popular sports worldwide, requires innovative training approaches to address modern challenges in skill development and player performance (Oboeuf et al., 2020). Previous studies have shown that integrating mobile learning into football training effectively improves players' understanding and skills.

Traditional football training methods, which predominantly rely on direct on-field approaches, often face limitations related to time, cost, and accessibility (Armitage et al., 2024). Technology-based methods, such as mobile learning, offer solutions to overcome these constraints. With mobile devices, players can access training materials anytime and anywhere, supporting self-directed learning beyond formal sessions. However, the implementation of this technology requires rigorous validity testing to ensure that the developed model meets training needs and can be effectively applied in the sports context (Tierney, 2021).

Previous studies have explored the use of technology in sports training, such as Yuniarto et al. (2018), who developed mobile learning-based educational media for basic futsal techniques and rules, which proved to enhance learners' motivation and understanding. Similarly, Tomoliyus and Sunardianta (2020) emphasized the importance of instrument validation in sports to ensure measurement accuracy and relevance. However, most of these studies tend to focus on technology development without paying sufficient attention to the validity testing of the resulting training models.

This study aims to fill that gap by focusing on evaluating the validity of a mobile learning-based circuit training model for football players. This evaluation seeks to ensure that the developed training model is relevant to the needs of modern football training and capable of supporting optimal player performance development. Based on these considerations, the hypothesis of this study is that

the developed mobile learning-based circuit training model is valid and meets the requirements for effective implementation in football training.

2. METHODS

2.1. Design and Participants

This study employed a quantitative approach with a development research design. The purpose of this approach was to develop and evaluate the validity of a mobile learning-based circuit training model for football players. The model development process followed the stages of research and development (R&D), which consists of three main phases: needs analysis, model development, and model validation (Sugiyono, 2018).

The study was conducted at the Faculty of Sports and Health (FOK), Universitas Pendidikan Ganesha (Undiksha), which provides comprehensive facilities to support the implementation of this research. The study took place over seven months, from April to November 2024.

The research subjects consisted of students enrolled in the football course at FOK Undiksha. A total sampling technique was employed, whereby all students registered in the course were included as participants. The total number of participants was 50 students (41 males and 9 females), aged between 18 and 22 years, with an average age of 20 years.

2.2. Procedures and Instruments

2.2.1. Needs Analysis

This phase aimed to identify the requirements of football players regarding technology-based training. Data were collected through interviews with football course instructors, observations of training sessions, and a literature review on circuit training methods. The results of this analysis were used to design a mobile learning-based training model.

2.2.2. Training Model Development

The training model was designed by integrating the principles of circuit training with mobile learning technology. The materials and exercises in the model were tailored to the needs of football players, encompassing physical, technical, and strategic training. The mobile learning platform provided easy access to training videos, step-by-step exercise descriptions, and self-assessment tools.

2.2.3. Model Validation

The model was validated by three experts in the fields of sports training, educational technology, and educational evaluation. The experts assessed the content, format, and alignment of the training model with the needs of the participants. A Likert scale instrument with five categories (1 = strongly disagree to 5 = strongly agree) was used for validation. The validation data were analyzed by calculating the mean score provided by the experts, which was then converted into a percentage to determine the level of content validity.

The instrument consisted of indicators for validating the content, format, and alignment of the model, evaluated by experts using a Likert scale.

2.3. Data Analysis

The validation data were analyzed using SPSS software by calculating the mean scores from the expert evaluations, which were then converted into percentages to determine the validity category. The results of the analysis were presented in tables and interpreted according to the established criteria.

3. RESULTS

3.1. Needs Analysis

The results of the needs analysis were obtained through interviews, observations, and a literature review. The findings indicated that the majority of students faced challenges in understanding traditional training methods, such as a lack of variation in training approaches and limited time for individual evaluation (Table 1). This analysis highlights the importance of developing a mobile learning-based model to enhance students' understanding and motivation in football training.

Table 1. Results of interviews and observations

Aspect	Results of Interviews and Observations
Training needs	A training model that supports independent and technology-based learning.
Main challenges	Lack of training variety, limited time, and difficulty accessing training materials independently.
Expectations for the model	Technology-based training that is engaging, easy to use, and aligned with football training needs.

3.2. Development of the Training Model

The training model was designed based on the needs analysis results and consists of several key components:

- a. **Training Materials:** Physical, technical, and strategic exercises formatted as circuit training.
- b. **Technological Platform:** A mobile learning application providing training videos, step-by-step guides, and self-assessment tools.
- c. **Training Structure:** A program organized into three difficulty levels (beginner, intermediate, and advanced).

A prototype of the model was piloted on a limited scale prior to the validation phase to ensure all features were accessible to participants.

3.3. Model Validation

Validation was conducted by three experts using an assessment instrument based on a Likert scale (1 = very unsuitable to 5 = very suitable). The three main aspects evaluated were content, format, and model relevance. Based on the validation results, the training model was deemed highly valid, with an overall average score of 4.74, categorized as "Very Valid." (Table 2).

Table 2. Model validation results by experts

Validation Aspect	Expert 1	Expert 2	Expert 3	Average Score	Category
Content	4.8	4.7	4.9	4.8	Very Valid
Format	4.5	4.6	4.7	4.6	Very Valid
Relevance	4.9	4.8	4.8	4.8	Very Valid
Overall Average	4.73	4.7	4.8	4.74	Very Valid

4. DISCUSSION

This study aimed to develop and validate a mobile learning-based circuit training model for football players. The results indicated that the model demonstrated a very high level of validity, with an average validation score of 4.74. These findings underscore the significant contribution of technology integration in sports training to improving training quality.

The needs analysis revealed an urgent demand for innovation in sports training methods, particularly in football. This aligns with the findings of Prasetyo et al. (2018), who stated that the

application of mobile learning in Physical Education, Sports, and Health (PJOK) can enhance learning effectiveness by providing flexible access and interactive materials. In this context, the developed training model successfully addressed several key limitations of traditional training methods, such as monotony and limited time for individual evaluation.

The model validation conducted by experts showed that the content, presentation format, and alignment of the training model with participants' needs met the required standards for broader application (Widiawati et al., 2023). The average validity score of 4.74 (categorized as highly valid) indicates that the model is reliable as an alternative to traditional football training methods. These findings are consistent with the study by Setiawan (2019), which found that circuit-based training models effectively improve athletes' technical skills.

The mobile learning-based approach in this model facilitates the presentation of training materials in a visual and interactive manner, which has been shown to enhance learning retention. This is corroborated by Pratama et al. (2023), who demonstrated that Smart Learning application-based instructional media significantly improved student learning outcomes. In this model, elements such as training videos, step-by-step exercise descriptions, and self-assessment tools provide flexibility and ease of access for participants (Samuel et al., 2024).

The validation results provide empirical evidence that the mobile learning-based training model is highly relevant for improving the quality of football training. The integration of technology not only makes training more engaging but also enhances participants' involvement and understanding of the training materials (Ali, 2020).

This study makes a significant contribution to the development of technology-based training methods in sports, particularly football. With its high validity, this model can be adopted as an effective alternative to complement traditional training methods. Furthermore, the model has the potential to be applied in other sports disciplines, with adjustments made to suit the specific needs of each sport.

However, this study has limitations, such as the absence of long-term trials to measure the model's impact on the physical and technical performance of football players. Future research is recommended to further explore the application of this model in competitive contexts and to develop additional features, such as video-based feedback and automated progress tracking.

5. CONCLUSIONS

This study successfully developed and evaluated the validity of a mobile learning-based circuit training model for football players. The model was found to be highly valid, with an average score of 4.74, demonstrating its relevance in addressing challenges in traditional football training, such as limited training variety and accessibility. The integration of mobile learning technology enhances the flexibility, engagement, and understanding of participants, aligning with the modern needs of football training. These findings suggest that the model offers a practical and innovative alternative to traditional training methods, with potential for broader application in other sports contexts after further adaptation.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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