

## Design of basic football skills test instrument for university students

### Diseño de instrumento de prueba de habilidades básicas de fútbol para estudiantes universitarios

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**Abstract.** Football is one of the practical courses included in the curriculum in three study programs at the Department of Sports Science, State University of Medan (Unimed). The football skills taught include short and long passing, receiving, dribbling, heading, and shooting. To date, there has not been a standardized skills test suitable for heterogeneous students, allowing lecturers to use it for assessment purposes. Therefore, it is necessary to develop a skill test so that the learning provided can be evaluated properly. It is widely recognized that assessment is a fundamental aspect of education, because inaccurate assessment can hinder the achievement of learning objectives. This study aims to identify the optimal approach to football skill test development for students. The research methodology used is the research and development (R&D) method. The research model used in this study is the Borg and Gall model which is only adopted consisting of several stages, namely needs analysis, design, development, and trial and validation. The population of the study (test takers) consisted of the male students of the Coaching Department (n=30), selected by a purposive sampling technique. The results of the analysis were analyzed using descriptive analysis and validation test analysis from expert assessments. The end result is a basic football technical test instrument, which includes instructions and drawings for each test. This test is useful for evaluating students enrolled in football courses, especially for university-level students.

**Keywords:** Football Learning, Basic Skill, Developed Technical Test, University Students.

**Resumen.** El fútbol es uno de los cursos prácticos incluidos en el plan de estudios de tres programas de estudio en el Departamento de Ciencias del Deporte de la Universidad Estatal de Medan (Unimed). Las habilidades futbolísticas que se enseñan incluyen pases cortos y largos, recepción, regate, cabeceo y tiro. Hasta la fecha, no ha existido una prueba estandarizada de habilidades adecuada para estudiantes heterogéneos, lo que permite a los profesores utilizarla con fines de evaluación. Por lo tanto, es necesario desarrollar una prueba de habilidad para que los aprendizajes proporcionados puedan ser evaluados adecuadamente. Es ampliamente reconocido que la evaluación es un aspecto fundamental de la educación, ya que una evaluación inexacta puede obstaculizar el logro de los objetivos de aprendizaje. Este estudio tiene como objetivo identificar el enfoque óptimo para el desarrollo de pruebas de habilidades futbolísticas para los estudiantes. La metodología de investigación utilizada es el método de investigación y desarrollo (I&D). El modelo de investigación utilizado en este estudio es el modelo de Borg y Gall, que solo se adopta y consta de varias etapas, a saber, análisis de necesidades, diseño, desarrollo, ensayo y validación. La población del estudio (examinados) estuvo constituida por los estudiantes varones del Departamento de Coaching (n=30), seleccionados mediante una técnica de muestreo intencional. Los resultados del análisis se analizaron mediante análisis descriptivo y análisis de pruebas de validación a partir de evaluaciones de expertos. El resultado final es un instrumento básico de prueba técnica de fútbol, que incluye instrucciones y dibujos para cada prueba. Esta prueba es útil para evaluar a los estudiantes matriculados en cursos de fútbol, especialmente para los estudiantes de nivel universitario.

**Palabras clave:** Aprendizaje de fútbol, Habilidad básica, Prueba técnica desarrollada, Estudiantes universitarios.

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## Introduction

Evaluation plays a crucial role in education, particularly in assessing the teaching and learning process to gauge the effectiveness of learning (Ibarra-Sáiz et al., 2020; Komaini et al., 2024; Lee et al., 2020; Pitnawati et al., 2023; Umar et al., 2023). A well-designed assessment system should be capable of presenting a summary of the learning quality (Almufarreh et al., 2023; Irawan et al., 2024; Olivares Olivares et al., 2021). This overview can help lecturers in effectively planning their teaching and learning strategies for improved student outcomes (Filgona et al., 2020; Nguyen et al., 2021). In the context of education taking place on a physical campus, especially in classroom environments, it is widely accepted that instructors hold considerable accountability for the results (Filgona et al., 2020; Guzzardo et al., 2021; Valtonen et al., 2021; Vilchez et al., 2021). So that Lecturers need to possess assessment abilities as a discipline that underpins their responsibilities, specifically in assessing the academic achievements of students

(Doyle et al., 2021; Quinlan & Pitt, 2021; Winstone et al., 2022).

One of the subjects and athletic activities included in the syllabus across three academic programs at the Department of Sport Sciences is football (D'Elia et al., 2023; dos Santos, 2022; Insani et al., 2024). The lecture material consists of two main components: theory and practice. The theoretical aspect covers the history and rules of the game of football, while the practical component encompasses fundamental football techniques such as passing, receiving, dribbling, heading, and shooting (Likardo et al., 2023; Potop et al., 2022; Rambe et al., 2024). In addition to these elements, there is also a focus on tactical strategies and team dynamics during gameplay (Chaeroni et al., 2024; Sari et al., 2024). The detailed information is outlined in the Semester Program Plan of football courses within the Sports Education, Physical Education, Health, & Recreation, and Sports Coaching Study Programs offered by the department. On this particular occasion, it discusses the pragmatic elements of the basic skills instructed in the football course. To better

assess students' practical skills in football courses, effective measurement and assessment are necessary.

As we delve deeper into the design of a comprehensive football skills test tool for college students, it is crucial to consider the various factors that affect the assessment process. With that in mind, understanding the background of the diverse student population, including gender, anthropometry, sports experience, biomotor ability, psychological traits, and other unique aspects is essential in developing a fair and comprehensive assessment tool (Loland, 2020; Zhao et al., 2023). In addition, the availability of equipment in learning also plays an important role in designing effective assessment tools (El Firdoussi et al., 2020; Makri et al., 2021; Regmi et al., 2020). Access to the right sports facilities and equipment is essential in making meaningful assessments of basic football skills (Duncan, Weldon, et al., 2022; McCalman et al., 2022; Uehara et al., 2021). In addition, it is crucial to thoroughly explore the specific components of a football skills test kit – including scoring criteria, methods for scoring points as well as practical considerations for implementation (Faber et al., 2021; Robinson et al., 2024).

While it's important to consider the various factors that affect the assessment process, designing a comprehensive football skills test kit for college students can pose some challenges. One of the main concerns is the potential for bias in the assessment process. Factors such as gender, sports experience, and anthropometry can affect a student's performance on a football skills test (Popowczak et al., 2020; Primasoni et al., 2024). For example, students with previous experience in football may have an unfair advantage over those who are new to the sport (Pérez-González et al., 2021). In addition, the use of specific assessment criteria and assessment methods may not capture the student's wide range of abilities and potentials (Hooda et al., 2022; Redman et al., 2021). Additionally, the adequacy of available sports facilities, equipment, and trained staff can vary across different universities, leading to inconsistencies in the assessment process (Baugh et al., 2020; Bin Othayman et al., 2022). This can result in unequal opportunities for students to demonstrate their skills, especially if some universities have better resources than others (Huang et al., 2020). Given these challenges, it may be necessary to reconsider the reliance on standardized football skills tests as the only measure of a student's practical skills in a football course. Instead, a more holistic approach that combines different assessment methods and takes into account individual differences and contextual factors should be considered.

The design of football skills test instruments for college students requires a comprehensive approach that takes into account the diverse student population and potential challenges that may arise in the assessment process. While it is important to develop tools that effectively measure practical skills in football, it is equally important to address concerns about bias, unequal access to resources, and the limitations of standardized tests. As such, the grading system can better reflect students' diverse abilities and potentials

on the football field, ultimately leading to a more balanced and fair evaluation of their practical skills. In this article, we will explore deep learning planning for children with special needs. We will discuss practical steps in developing an effective learning plan, including identifying children with specific learning needs, setting realistic learning goals, choosing the right learning methods, and continuing the evaluation of learning outcomes. In evaluating the design of basic football skills test instruments for college students, key characteristics include reliability, validity, and fairness. The goal is to create a test that accurately assesses the basic skills of the ball, accommodates students' diverse backgrounds and minimizes bias.

## Material & methods

This research used a comprehensive research and development approach, which involved ten detailed steps. The research consists of needs analysis, design, development, and trial and validation, Brog and Gall in (Sugiyono, 2018). The research was conducted for about six months from June to November 2023 on the Unimed (Universitas Negeri Medan) football field. Participants in this research were enlisted from three academic programs within the Department of Sport Sciences: Sports Science, Physical Education, Health & Recreation, and Sports Coaching Education. The participants comprised university students who had completed the football course, reflecting a wide variety of gender and sports involvement. The population of the study (test takers) consisted of the male students of the Coaching Department ( $n=30$ ), selected by a purposive sampling technique. The validity of the instrument was determined through data analysis from the score of 6 skill tests and technical assessments by two judges. The correlation between the results of the skill test and the assessment of the two judges was determined with a significance level of 0.05% by comparing observed with  $r_{table}$ . Meanwhile, the reliability test of the instrument was carried out after the validity criteria were obtained. The reliability of the instrument was determined by the test-retest method on different days, especially the first and second days. The validity and reliability of the instruments are classified into several categories, as listed in Table 1.

Table 1.  
Validity and Reliability Criteria (Kirkendall et al., 1987)

Validity Criteria		Reliability Criteria	
Interval Score	Category	Interval Score	Category
0.80 – 1.00	Very High	0.93 – 1.00	Very High
0.70 – 0.79	High	0.88 – 0.92	High
0.50 – 0.69	Adequate	0.68 – 0.87	Adequate
0.00 – 0.49	Unacceptable	0.00 – 0.67	Unacceptable

## Results

The results of this research are presented in accordance with the stages of Brog and Gall research and development:

### a. Need Analysis

Based on the results of a survey conducted at the Faculty

of Sports Sciences, Universitas Negeri Medan, it was found that most of the respondents (95.14%) stated the need to develop a basic football skills test. The survey results also showed that 75.69% of respondents felt that the tests used were not in accordance with the characteristics of students, while 93.06% of respondents questioned the validity and reliability of the existing tests. These findings highlight the importance of developing more representative and consistent skills test standards in football education in universities.

#### b. Design

At this stage, researchers have designed six types of basic football skills tests based on the results of previous studies. These tests include: Short Passing, which involves passing the ball to a goal in the form of a wall with different score points for each part; Long Passing, which measures the accuracy of passing over longer distances to different circles on the course; Receiving, where the testi must receive the bounce of the ball from the wall within a certain duration of time; Dribbling, which measures speed and skill in dribbling through a series of cones; Shooting, which assesses the accuracy of a shot to the target with a different score for each part of the target; and Heading, which measures the accuracy of heading the ball to the target wall. This test is designed to provide a more representative picture of the basic skills of football for test takers.

#### c. Development

In this section, the form of the sketch of the instrument to be developed is explained, then how to do the instrument is also presented. The football skills test for university students includes several key components, each designed to evaluate different aspects of their proficiency, The following is the development:

##### 1. The Short Pass Targetted Square-on-Wall test

Involves performing five short passes within 10 meters of a wall, which is divided into five sections with varying point values: the centermost section scores 3 points, the left and right sections score 2 points, and the periphery scores 1 point. The accumulated score reflects the testee's short passing accuracy.

##### 2. M-Dribbling Test

The student dribbles through a course marked by five cones, with timing starting when they cross the finish line with the ball; the time taken indicates their dribbling ability.

##### 3. Wall Pass-Receive Test

Measures the ability to pass and receive a ball against a wall, where the testee has 20 seconds to complete as many successful receptions as possible, illustrating their receiving skills.

##### 4. Long Pass Targetted Circle Test

Involves performing five long passes from 28 meters

away to hit targets of varying sizes, with scores based on the distance from the center of the circle: 3 points for the innermost circle, 2 for the second circle, and 1 for the outermost circle. The accumulated score shows the student's long passing accuracy.

##### 5. Shooting Targetted Square-on-Wall Test

Requires the testee to perform five shots from either 16 meters (men) or 12 meters (women) at a wall segmented into various scoring sections, where scores are awarded based on accuracy: the centermost section scores 1 point, the left and right sections score 2 points, and the periphery scores 3 points.

##### 6. Wall Heading Test

Involves heading the ball against a wall from a distance of 150 cm for 20 seconds, with the accumulated score indicating heading proficiency. Each test is designed to comprehensively assess the fundamental football skills essential for university students.

#### d. Validity and Reliability

Before entering the validation and reliability results, the table shows the values of the correlation coefficient ( $r$ ) for various tests. The  $r$ -value recorded in the table is 0.361. So the whole test has very high and high validation. For more details, please see the table below:

Table 3.  
Results of Validity and Reliability of each instrument

Test Name	Validity	Reliability
Short Pass Targetted Square-on-Wall	High ( $r = 0,744$ )	High ( $r = 0,910$ )
M-Dribbling	High ( $r = 0,734$ )	High ( $r = 0,904$ )
Wall Pass-Receive	High ( $r = 0,728$ )	High ( $r = 0,910$ )
Long Pass Targetted Circle	High ( $r = 0,722$ )	High ( $r = 0,908$ )
Shooting Targetted Square-on-Wall	High ( $r = 0,789$ )	Very High ( $r = 0,922$ )
Wall Heading	Very High ( $r = 0,840$ )	Very High ( $r = 0,945$ )

#### e. Revision

The researcher decided to revise the short passing skill, while the other five skills did not undergo a revision because they had obtained the desired score distribution. The revisions made to the short passing skill include adjustments to the target dimensions, which are now smaller at 75 cm in height and 325 cm in width. The goal is divided into five sections with a size of 65 cm each, and the scoring scheme follows the previous format: a score of 3 for the center, a score of 2 for the right and left sides, and a score of 1 for the most marginal part. This test is carried out by testing the test to make short passes five times, with the results of the accumulated score as an indicator of skills in short passing.

#### f. Final Product Revision

Table 4.  
Final result of the revised instrument

Test Name	Instrument Sketch	How to do
Short Pass Targetted Square-on-Wall		<ol style="list-style-type: none"> <li>1. It is carried out within 10 m of the target.</li> <li>2. The target is a wall measuring 75 cm high and 250 cm wide. The target is divided into 5 parts that have a size of 50 cm each.</li> <li>3. The target is given a score each: the center with a score of 3, the left and right with a score of 2, and the fringmost part with a score of 1. Testi passed 5 times.</li> <li>4. Score accumulation is an illustration of the testi's skills in making short passes.</li> </ol>
M-Dribbling		<ol style="list-style-type: none"> <li>1. The testee dribbled from the starting line straight ahead for 5 m which was marked by the first cone, then the testee went to the second cone which was 2.83 m away with the third cone, and so on until the fifth cone. Then, the testee headed for the finish line.</li> <li>2. To enter the finish, the stopwatch is turned off by the officer/tester when the testee has crossed the finish line with the ball.</li> <li>3. The time taken by the testee to complete the route illustrates their dribbling ability.</li> </ol>
Wall Pass-Receive		<ol style="list-style-type: none"> <li>1. Performed within 3 m of the target.</li> <li>2. The target is a wall measuring 75 cm high and 375 cm wide.</li> <li>3. Testee passes to the wall as a target for 20 seconds.</li> <li>4. Testee must receive the bounce of the ball from the wall.</li> <li>5. The number of tests that can receive the ball within 20 seconds is an illustration of the testee's skills in receiving.</li> </ol>
Long Pass Targetted Circle		<ol style="list-style-type: none"> <li>1. It is carried out within 28 m of the kick point.</li> <li>2. The target is in the form of a circle in the field with a radius of 2 m, 4 m and 6 m.</li> <li>3. The target is given a score each: the innermost circle with a score of 3, the second circle with a score of 2, and the outermost circle with a score of 1.</li> <li>4. Testi passed 5 times.</li> <li>5. Score accumulation is an illustration of the testi's skills in making long passes.</li> </ol>
Shooting Targetted Square-on-Wall		<ol style="list-style-type: none"> <li>1. Performed within 16m (men) and 12m (women) of the target.</li> <li>2. The target is a wall measuring 244 cm high and 732 cm wide. The target is divided into 5 sections that have sizes, the centermost target is 300 cm wide, the left and right are 175 cm wide, and the most edge is 91 cm wide</li> <li>3. The targets are scored respectively: centermost with a score of 1, left-right with a score of 2, and periphery with a score of 3.</li> <li>4. The accumulated score resulting from 5 kicks is a description of the testee's skills in shooting.</li> </ol>
Wall Heading		<ol style="list-style-type: none"> <li>1. Performed within 150 cm of the target.</li> <li>2. The target is a wall measuring 4m high and 4m wide.</li> <li>3. The duration of the execution time is 20 seconds.</li> <li>4. The accumulation of scores generated in 20 seconds of heading is a description of the testee's skills in heading.</li> </ol>

## Discussion

The evolution of football basic assessment is progressing, along with the increase in expertise and skills in football fundamentals (Akbar et al., 2024; Liza et al., 2024; Paixao et al., 2021). Continuous adjustments made to test items based on participants' performance in field trials reflect a commitment to creating a comprehensive and fair assessment tool. It also highlights the considerations given to the different skill levels of participants, ensuring that the test accurately evaluates their skills. Repeated procedures of

development and improvement also make it possible to create assessments that not only evaluate the participant's abilities effectively but also ensure fair assessments at different levels of proficiency.

Compared to certain types of assessments, this newly developed test provides a thorough evaluation of basic football skills. However, college-level football requires a deep understanding and consistent application of playing techniques. Evaluating physical fitness is a separate priority from this type of course at the university level, while technical abilities such as juggling may not be essential to the game

and can present difficulties for students without a strong football background (Barnett et al., 2020; Mills et al., 2020; Schudde et al., 2022). It is crucial to recognize that proficiency in these areas can significantly affect overall performance in the field. According to research conducted by Pérez-Contreras et al (2022) that in football shows that speed and physical performance increase with age and experience. Professional players outperform younger players, thus forming the basis for designing effective skills tests for college students.

The form of test development can also be attributed to age and gender differences. Children and adolescents, for example, may have different levels of physical development and varying levels of technical proficiency in football skills (Abarghoueinejad et al., 2021; Duncan, Eyre, et al., 2022; Koopmann et al., 2020). As such, when developing tests for this demographic, it is important to consider the suitability of test items and ensure that they are aligned with the participant's developmental stage. Test items that may be suitable for university-level students may not be appropriate for younger participants due to differences in physical ability and skill development (Brunswick & Bargary, 2022; Chiwaridzo et al., 2020; Niemistö et al., 2020; Oral & Erkilic, 2022). In addition, considering cognitive and emotional development is essential in test design. It is important to create a supportive and encouraging testing environment for participants of different age groups, recognizing that their psychological readiness and motivation to perform football skills can vary (Berengüi et al., 2022).

In addition, research shows that there are differences in the physical and technical components of football skills between male and female players (Farley et al., 2020; Schons et al., 2023; Toro-Román et al., 2023). The development of football instruments can emphasize on the adjustment of tests for player positions and anthropometric profiles (Villaseca-Vicuña et al., 2021). As such, when developing a football skills test, it is important to address any potential biases that may arise due to gender differences in performance. This may involve examining and modifying test items to ensure that they are equally applicable to both male and female participants, allowing for a fair and accurate assessment of their abilities. Consideration for gender-specific differences in the development of physical skills and abilities should be incorporated into the assessment design, ensuring that the test takes into account the unique attributes of male and female college students.

In summary, assessing technical skills in football requires careful consideration of factors such as age, gender, developmental stage, and skill background to ensure the accuracy and consistency of the evaluation. Assessments should be tailored to suit the specific requirements and characteristics of the population studied. Before relying on test results, it is important to verify the validity, reliability, and sensitivity of the assessment.

## Conclusion

The development of the basic football skills test, including short & long passing, receiving, dribbling, shooting, and heading techniques, has involved a rigorous process of iterative design, field testing, and validation. The resulting assessment tool reflects a commitment to providing a fair and comprehensive evaluation of fundamental football skills, taking into account the varying abilities and backgrounds of the participants. By recognizing the importance of age, gender, and skill background, the test has been tailored to address the specific requirements and traits of the university student population. It is essential to continue refining and validating the test to ensure its applicability and accuracy across diverse demographics and skill levels. The completion of the test's implementation and assessment procedures, along with the positive validation from expert professionals, marks a significant milestone in the development of a valuable resource for assessing fundamental football skills at the collegiate level. Ongoing collaboration with stakeholders in football and sports science will contribute to the continued improvement and relevance of the basic football skills test. Moving forward, research could include examining the test's performance across different age groups, genders, and skill levels to provide a comprehensive understanding of its applicability.

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