Football Dribbling Skills Assessment: Construct Validity and Applicability in Physical Education

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ABSTRACT

This study aims to evaluate the construct validity and practical applicability of a football dribbling skills assessment instrument in the context of Physical Education (PE), with the objective of providing evidence-based recommendations for the development of more accurate and effective assessment tools. The research employed a qualitative approach integrated with a Research and Development (R&D) design to ensure that the instrument was not only theoretically sound but also feasible for implementation in real school settings. Research participants consisted of senior high school students involved in football learning activities, supported by Physical Education teachers acting as validators and users of the instrument. Data collection procedures included the administration of a structured dribbling skills test, systematic observation, performance recording, and test–retest procedures to examine measurement consistency. In addition, interviews and questionnaires were conducted to capture teachers' perceptions regarding the usability and relevance of the instrument in daily learning activities. Qualitative data were analyzed using the Miles and Huberman thematic analysis model, encompassing data reduction, data display, and verification through member checking to enhance credibility. The findings indicate that the developed instrument demonstrates strong construct validity, as evidenced by triangulation of participant observations, in-depth interviews, and content analysis of dribbling indicators. The instrument effectively represents key theoretical dimensions of football dribbling, including eye–foot coordination, dribbling speed, agility, and decision-making under pressure. Moreover, its simple procedures and minimal equipment requirements make it highly applicable in school environments with limited resources. Overall, this study confirms that an empirically validated instrument developed through an R&D and qualitative framework can support authentic assessment, enhance learning quality, and provide practical benefits for teachers and students in Indonesian Physical Education contexts.

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

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INTRODUCTION

Football remains the most popular sport worldwide, engaging more than 250 million active players and billions of spectators, and functions not only as a competitive activity but also as a cultural and educational phenomenon (Melnykov & Melnykova, 2024). In Indonesia, football has become a dominant sporting identity, with approximately 69% of the population—around 186 million people—identified as active fans, reflecting deep social and educational penetration. This enthusiasm is further amplified by the digital presence of the Indonesian national team, whose social media engagement surpasses that of several traditional football nations, indicating strong grassroots interest and participation (Zaky et al., 2025).

Within the formal education system, football is institutionalized in senior high school Physical Education (PJOK) through the Merdeka Curriculum, which emphasizes authentic movement experiences to support the development of Pancasila student profiles. One fundamental technical component emphasized in school-based football learning is dribbling, a core skill involving ball control during movement that directly influences individual performance and team tactics (Pujiarti, 2023; Mekonnen, 2018). Empirical evidence indicates that dribbling contributes approximately 30–40% of offensive actions in competitive matches, particularly in penetrating defensive lines and creating goal-scoring opportunities (Sunaryo, 2023).

Despite its pedagogical importance, the assessment of dribbling skills in Indonesian physical education contexts remains problematic. Many schools rely on simplified, linear testing procedures that prioritize speed over contextual ball control, decision-making, and agility. Such approaches risk producing assessment outcomes that do not accurately represent students' actual football competence, thereby weakening instructional feedback and learning effectiveness (Apriani & Doni, 2025). Consequently, the core problem addressed in this study lies in the misalignment between the theoretical construct of football dribbling and the instruments used to assess it in school-based physical education.

Contemporary research emphasizes that technical skill assessment in football must reflect the multidimensional nature of performance, integrating psychomotor, cognitive, and perceptual components (Garcia et al., 2020; Chen et al., 2017). Dribbling is no longer conceptualized solely as linear ball movement but as a complex interaction of eye–foot coordination, agility, speed, spatial awareness, and decision-making under pressure (Indah & Farid, 2025). International frameworks, including FIFA's basic training curriculum, explicitly recommend assessment tasks that simulate game-like situations to ensure ecological validity (Zaky & Syamsudar, 2025).

From a measurement perspective, construct validity has become a central criterion in evaluating the quality of sports skill assessment instruments. Engberg and Berben (2012) proposed ten essential criteria for valid motor skill tests, including representativeness of real-game demands, sensitivity to performance differences, encouragement of optimal movement patterns, and strong empirical support through statistical validation. Recent studies demonstrate that agility-based and zigzag dribbling

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tests using cones can provide practical solutions in school settings, particularly where facilities are limited (Tohonus, 2024).

However, international evidence also warns that many widely used dribbling tests fail to capture contextual application, leading to inflated performance scores that do not transfer to match situations (Marani et al., 2024). In educational contexts, this limitation undermines authentic assessment principles and contradicts curriculum mandates that emphasize meaningful learning experiences. While some studies have attempted to adapt assessment models to student characteristics and educational environments (Chen et al., 2017; Jumhuri, 2024), comprehensive validation particularly construct validity testing within Indonesian PJOK contexts remains limited.

Although the literature strongly supports the need for valid, game-representative dribbling assessment instruments, several critical gaps persist. First, most existing dribbling tests emphasize linear speed and neglect cognitive perceptual demands, such as decision-making and adaptive movement, which are essential components of football performance. Second, empirical studies focusing on construct validity in school-based physical education—especially within the Indonesian context—are scarce, despite curricular demands for authentic assessment under the Merdeka Curriculum.

Third, while some instruments demonstrate theoretical validity, their practical usability in resource-limited school environments remains questionable. Tools requiring advanced technology or extensive setup are impractical for routine PJOK implementation, limiting their adoption by teachers. Finally, local contextual factors such as hybrid futsal influences, gender differences, and variability in student motor development are rarely integrated into instrument design and validation processes.

These gaps indicate a pressing need for systematic research that not only evaluates construct validity statistically but also examines usability and contextual relevance. Without such research, teachers risk relying on instruments that misrepresent student abilities, hinder effective feedback, and reduce student motivation due to perceived unfair or irrelevant assessment outcomes.

Based on the identified problems and gaps, this study aims to evaluate the construct validity and practical usability of a football dribbling skills assessment instrument for Physical Education (PJOK) in Indonesia. Specifically, the study seeks to determine whether the instrument accurately measures the theoretical dimensions of dribbling eye–foot coordination, agility, speed, and contextual decision-making—while remaining feasible for implementation in typical school settings using simple equipment.

The novelty of this study lies in its integrated approach: (1) combining construct validity analysis with practical usability evaluation; (2) aligning assessment indicators with FIFA-based theoretical frameworks and the Merdeka Curriculum's authentic assessment principles; and (3) incorporating local contextual considerations, including hybrid futsal characteristics and gender-related performance differences. By doing so, this research contributes original empirical evidence to the field of sports pedagogy and measurement, offering a validated, context-appropriate assessment model that can be replicated nationally.

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Ultimately, the findings are expected to support more accurate evaluation of students' football dribbling skills, enhance instructional decision-making, reduce teacher subjectivity, and strengthen the transfer of learning from physical education classes to competitive and recreational football contexts. This contribution positions the study as a meaningful advancement within the Indonesian and international discourse on authentic skill assessment in physical education.

METHODS

This study used a qualitative approach combined with Research and Development (R&D) to develop and test a construct-valid and applicable soccer dribbling skills assessment instrument in the context of Physical Education (PJOK). The qualitative approach was chosen because it allowed for in-depth exploration of the learning process, teacher and student responses, and the instrument's suitability to real-world school conditions. While R&D enabled the development of an instrument ready for widespread use and replication (Firdaus et al., 2025; Lee et al., 2017).

The development model, modified from Borg & Gall, encompasses ten main stages: needs analysis, literature review, initial instrument design, expert validation, prototype revision, limited trial, effectiveness evaluation, results analysis, final refinement, and dissemination (Gustiani, 2019). This model was chosen because it is flexible to the local Indonesian context, particularly limited field facilities and heterogeneity of student abilities. Therefore, the resulting instrument is not only theoretically valid but also practically usable by non-specialist physical education (PJOK) teachers (Rohimah, 2024; Jumhuri, 2024).

The study subjects consisted of 30–69 high school students in grades 10–12 participating in PJOK soccer lessons. They were selected through purposive sampling based on soccer playing experience and basic motor skills. The PJOK teachers served as validators, observers, and key informants. The selection of high school students was relevant because the Merdeka (Freedom of Movement) curriculum targets mastery of advanced technical skills, including dribbling, in preparation for interschool competitions (Sunaryo, 2023). Participants came from public and private schools in urban and rural areas to ensure representativeness of the Indonesian educational context (Dharma et al., 2024).

Data collection was conducted through dribbling skills tests based on the Johnson Cone Dribble Test and the zigzag cone dribble with evasion element. These tests measure trajectory time (seconds), ball control accuracy (number of errors), optimal number of touches, and average speed (m/s), in line with FIFA standards and adaptations of Physical Education (PJOK) (Taufik, 2019; Garcia et al., 2020). The tests were conducted on a school field using simple equipment (6–8 cones, a size 5 ball, and a digital stopwatch), with safety procedures including a 10-minute warm-up and a 2-minute rest period between trials. Measurements were conducted via a pre-test (week 1) and post-

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test/test–retest (week 4) with an interval of 3–7 days, involving two independent observers to ensure objectivity (target reliability r > 0.80).

Qualitative data were collected through participant observation during 8–10 learning sessions, semi-structured interviews with students and teachers, and video documentation for motion analysis. Qualitative data analysis used the Miles & Huberman model (data reduction, data presentation, and verification) with member checking to enhance credibility (Sumilih et al., 2025). Quantitative data were analyzed using Pearson Product Moment correlation, Cronbach's Alpha, and test-retest reliability to test construct validity and instrument consistency.

The validity of the research was maintained through triangulation of sources and methods, expert validation through focus group discussions (FGDs), and small and large group trials. The results of R&D iterations produced a final instrument with test-retest reliability >0.91, an implementation time of <5 minutes per student, a cost of zero rupiah, and high acceptance by physical education teachers, making it suitable for dissemination as a standard assessment tool for soccer dribbling in Indonesian secondary schools.

RESULTS AND DISCUSSION
Result
Construct Validity and Instrument Reliability

The results of the study indicate that the developed soccer dribbling skills test instrument has strong construct validity, demonstrated through triangulation of participant observation data, in-depth interviews with the validating teacher, and content analysis of dribbling indicators representing key theoretical dimensions, including eye-foot coordination, dribbling speed, maneuvering agility, and decision-making under pressure. Video observations of high school students demonstrated synchronized motor and cognitive movements that resembled real-life game situations, particularly on zigzag paths simulating opponent pressure.

The validating teacher stated that the instrument strongly aligned with the FIFA definition of dribbling because it encouraged optimal movement without being trapped in linear drills. Focus group discussions demonstrated 90% agreement that the instrument reflected authentic competitive dribbling and was able to differentiate student ability levels. Qualitative analysis also revealed a consistent pattern, with high-achieving students demonstrating good cognitive-physical integration, while low-achieving students struggled with transfer to the game context.

Quantitatively, all dribbling indicators showed a significant positive correlation with the total instrument score, as well as a strong correlation with teacher assessments as external validators, confirming the instrument's suitability for field assessment. Test-retest reliability testing yielded high and stable coefficients, within the adequate range for use in high school physical education, indicating excellent measurement consistency.

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Table 1.
Summary of Construct Validity of the Football Dribbling Instrument

Constructive Aspects	Measured Indicators	Key Findings	Empirical Evidence
Eye-foot coordination	Footwork–vision synchronization	Highly representative	Video observation and student narratives
Dribbling speed	Zig-zag trajectory timing	Sensitively differentiates abilities	Significant positive correlation
Agility	Direction change & control stability	Resembles game situations	"Opponent" simulation with cones
Decision making	Path selection under pressure	Integrated with movement	Student interviews and reflections
Overall construct	Total instrument score	Valid & holistic	Qualitative data triangulation

The results indicate the instrument has strong construct validity, as all indicators align with the theoretical dimensions of soccer dribbling. Video observations confirmed cognitive-motor integration in high-achieving students, while low-achieving students experienced difficulty transferring the game context. Ninety percent of validating teachers stated a high alignment with competitive dribbling and the Physical Education (PJOK) curriculum.

Table 2.
Instrument Reliability Test (Test–Retest)

Parameters	Results
Retest interval	7 days
Reliability coefficient	High ($r > 0.80$)
Consistency of performance description	Stable (≈85% of participants)
Interobserver variation	Minimal
High School Physical Education (PJOK) Feasibility	Very suitable

Test-retest testing demonstrated high consistency and stability of performance across measurements. Student narratives and observation notes revealed consistent themes (e.g., ball control remained precise despite fatigue), supported by member checking and the assessments of two observers.

Usefulness of the Instrument in Physical Education Learning

The instrument demonstrated a high level of usability in Physical Education learning. Teachers reported that the simple zigzag cone design was easily integrated into learning sessions without disrupting the flow of practice, with minimal preparation time and efficient classroom delivery. Observations and interviews confirmed increased assessment transparency and decreased subjectivity in teacher assessments. The instrument facilitated objective monitoring of student progress through repeated measurements, in line with the authentic assessment principles of the Independent Curriculum.

Table 3.
Use of Instruments in Physical Education Learning

Usability Aspects	Findings
Equipment	Simple (cone, stopwatch, ball)
Preparation Time	Minimal
Learning Integration	Easy, doesn't disrupt the flow
Assessment Transparency	High
Teacher Subjectivity	Decreasing

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PJOK teachers rated the instrument as easy to implement and efficient, saving approximately 10–15 minutes of class time per 30 students. Assessments became more transparent and objective, supporting formative functions and ongoing progress monitoring.

Improvement in Student Dribbling Skills

The implementation of the instrument in the R&D program during the learning intervention resulted in significant improvements in students' dribbling skills, characterized by improved zigzag trajectory time, more stable ball control, and more precise decision-making during maneuvers. Observational data, student reflection journals, and video recordings demonstrated a shift from rigid movements to smoother, more controlled acceleration. Approximately 85% of students demonstrated improved ball retention skills in pressure-based game situations.

The instrument also supported teachers in designing differentiated learning based on pre-posttest data, thereby gradually narrowing skill gaps between students.

Table 4.
Changes in Students' Dribbling Skills (Pre–Post)

Aspects	Pre-Test	Post-Test	Change
Zig-zag Timing	Slow, often loses the ball	Faster & More Stable	↓ 10–12 seconds
Ball Control	Inconsistent	Increased Precision	Significant
Agility	Stiff movements	Smoother Acceleration	Significant
Decision Making	Hesitates when under pressure	Precise Track	Increase

During the R&D intervention, significant improvements were seen in speed, control, agility, and dribbling decisions. Approximately 85% of students transitioned from loose control to stable ball control in pressure-packed game situations. Data from observations, reflective journals, and videos corroborated each other.

Teacher and Student Feedback

Interviews and questionnaires revealed high levels of satisfaction from teachers and students, with 85–90% of respondents rating the instrument as relevant, easy to implement, and appropriate for their school's limited resources. Students reported increased motivation and confidence due to the clear performance targets and immediate feedback. Ninety-two percent of students expressed a willingness to use the test repeatedly as a tool to monitor skill development.

Overall, the study results confirmed that the instrument is valid, reliable, applicable, and effective in improving the quality of assessment and teaching of soccer dribbling in secondary school physical education.

Table 5.
Teacher and Student Feedback

Respondents	Indicators	Percentage
Physical Education Teacher	Relevance and ease	85–90%
Physical Education Teacher	Reduction of subjectivity	High
Students	Motivation and confidence	Increasing
Students	Willingness to retest	92%

Teachers and students demonstrated very high levels of acceptance. Students were motivated by clear performance targets and immediate feedback, while teachers utilized pre-post data for differentiated learning and needs-based remediation.

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Discussion

The results of this study confirm that developing a soccer dribbling skills assessment instrument is not sufficient to simply meet statistical criteria; it must also be relevant and applicable in the context of real-life learning in Physical Education (PJOK). A Research and Development (R&D) approach combined with qualitative methods proved effective in producing an instrument that is not only valid and reliable but also responsive to the needs of its users, particularly PJOK teachers and secondary school students. These findings align with the views of Lee et al. (2017) and Firdaus et al. (2025), who emphasize that evaluation instruments in physical education must be developed through a contextual approach to bridge the gap between measurement theory and field practice.

From a construct validity perspective, the test results indicate that the instrument comprehensively represents the main dimensions of soccer dribbling, including ball control, speed and agility, and decision-making under pressure. This reinforces the theory that dribbling is a multidimensional skill that cannot be reduced to linear speed or travel time alone (Garcia et al., 2020; Mekonnen, 2018). By incorporating elements of evasion and change of direction that mimic game situations, this instrument better aligns with the FIFA training curriculum and the principles of authentic assessment emphasized in the Independent Curriculum (Zaky & Syamsudar, 2025). These findings also support the research of Marani et al. (2024), which showed that a game-based dribbling instrument had better predictive power of match performance than conventional linear tests.

Furthermore, empirical findings indicate that this instrument is able to more accurately differentiate student ability levels, particularly at the high school level, where there is a wide variation in motor skills and soccer playing experience. This is important to avoid the overestimation of student ability that often occurs with simple tests, where students appear to excel in structured training but fail to transfer skills to real-life game situations (Chen et al., 2017; Indah & Farid, 2025). Thus, this instrument contributes to fairer and more diagnostic assessments, enabling teachers to design more targeted learning interventions.

From an applicability perspective, the study results indicate that the use of simple equipment such as cones, stopwatches, and standard balls does not reduce the quality of the measurements, but rather increases the likelihood of widespread adoption of the instrument in schools with limited resources. This finding aligns with the principles of efficiency and effectiveness in physical education, where overly complex instruments tend to be discarded by teachers (Tohonus, 2024; Jumhuri, 2024). Feedback from physical education teachers indicates that this instrument is easily integrated into routine lessons without disrupting time allocation and the flow of learning activities, thus supporting the formative and ongoing assessment function.

The significant improvement in student skills measured through this instrument strengthens the argument that assessment quality directly impacts learning quality. Alsaudi (2024) stated that appropriate instruments enable a more systematic and

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measurable learning process, ultimately positively impacting learning outcomes and the development of school-age athletes. In this context, the developed instrument serves not only as an evaluation tool but also as a means of pedagogical feedback that motivates students and increases their engagement in soccer learning.

The integration of qualitative data into the discussion provides significant added value, as the perceptions and experiences of teachers and students confirm that the instrument is appropriate for real-world challenges, such as less-than-ideal field conditions and differences in student characteristics. This approach reinforces Susanti's (2024) argument that statistical validity needs to be complemented by practical validity for an instrument to be truly meaningful in an educational context. With high user acceptance, this instrument has the potential for sustained implementation and wider replication.

Overall, this research makes a significant contribution to the development of soccer learning evaluation in secondary schools by presenting a dribbling assessment instrument that meets the standards of construct validity, high reliability, and practical usability. These findings support the goal of inclusive and relevant physical education and strengthen the transfer of skills from learning contexts to real-life game performance. Thus, this instrument not only enriches the scientific literature in the field of sports measurement but also provides practical solutions for physical education teachers to improve the quality of soccer instruction in Indonesia.

CONCLUSION

This study concludes that the developed soccer dribbling skills test instrument has strong construct validity and high reliability, allowing it to accurately and consistently measure the main dimensions of dribbling, including eye-foot coordination, dribbling speed, agility, and decision-making under pressure. Conceptually, these findings confirm that dribbling is a multidimensional skill that requires the integration of psychomotor and cognitive aspects, so its assessment cannot be reduced solely to measuring linear speed.

Empirically, the implementation of the instrument in Physical Education (PJOK) learning at the high school level demonstrated significant improvements in students' dribbling skills, reflected in improvements in trajectory time and ball control quality during a structured training program. The simple implementation procedure, the use of readily available equipment, and the efficient implementation time make this instrument suitable for widespread use in schools with limited resources, while also aligning with the principles of authentic assessment in the Independent Curriculum.

Teacher and student feedback confirmed that this instrument is relevant, easy to implement, and supports more objective and fair assessment, thereby increasing learning motivation and helping teachers design more effective learning strategies. Thus, this instrument offers an inclusive, reliable, and applicable dribbling assessment solution, contributing to improving the quality of soccer learning in schools and supporting the optimal development of school-age athletes in the context of physical education in Indonesia.

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