



Trends of Football Research Publications: A Bibliometric Analysis

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Abstract

Football is one of the most widely studied sports in physical education research, yet comprehensive mapping of its publication trends remains limited, particularly in the context of developing regions. This research aims to analyze the development of football research thru a bibliometric analysis approach on published research subjects, in order to identify trends in the number of publications, citation trends, journals with the highest number of publications, researcher trends, as well as patterns of research topic relationships thru network visualization, overlay visualization, and density visualization. This research is based on a literature review conducted thru the Scopus database using the Dimensions application, with the assistance of VOSviewer software version 1.6.20. The PRISMA flow diagram (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is used as a reporting guideline that includes the stages of identification, screening, and study eligibility. The analyzed data includes football research publications released within the period from 2020 to 2025. The results show a consistent increase in football research publications from 2020 to 2024, with 454 articles analyzed. Network visualization identified three research clusters: quantitative-experimental approaches (dominated by SPSS, post-test, and experimental group), qualitative-process approaches (process, experience, value), and outcome-oriented studies. Overlay visualization confirms that experimental and statistical analysis topics are the most recent and active research trends, while a novelty gap exists in integrating statistical methods with process-oriented learning studies. Thus, current research trends are more focused on experimental approaches and statistical analysis in the context of education.

How to Cite

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INTRODUCTION

Global issues in football research show that the development of football curriculum and pedagogy is increasingly receiving attention in the realm of physical education. Several systematic studies show that the implementation of game-based learning models and educational strategies such as Teaching Games for Understanding (TGfU), Small-Sided Games (SSG), and hybrid approaches have been proven to improve technical and tactical skills, as well as student engagement in football learning at school (Ridwan 1a-E & Adil 2b-D, 2025) ; Journal of Sport Education, Coaching, and Health) A Systematic Review of Football Tactics Learning in Physical Education Curriculum (2025) . Bibliometric analysis of football research also shows an increase in the number of publications in the last decade, with a growing focus on learning strategies, sports pedagogy, and technology integration in football learning (Research Trends in Football Training for Young Players , (Ridwan 1a-E & Adil 2b-D, 2025)).

This study demonstrates the importance of the teacher's role in implementing a pedagogical approach that is adaptive and responsive to the needs of students. Other systematic reviews related to soccer emphasize that the process of teaching soccer from an early age requires a comprehensive strategy, involving pedagogical aspects, technical-tactical skills, and the main social context (Teaching grassroots soccer: a systematic review , (Almonacid-Fierro et al., 2024). In addition, research on physical education curriculum in general shows an increasing trend of bibliometric publications that allow mapping of dominant topics such as the hidden curriculum and the interaction between theory and practice of physical education curriculum (Curriculum and Physical Education: Bibliometric analysis (Gazali & Saad, 2023).

Although the trend of football research publications in curriculum and pedagogy shows an increase, there are several significant research gaps that need to be addressed. Existing studies tend to focus on specific learning methods such as Game-Centered Approaches (e.g., TGfU and SSG) without integrating other innovative learning strategies or evaluating their impact on students' holistic competencies longitudinally (Ridwan 1a-E & Adil 2b-D, 2025); Journal of Sport Education, Coaching, and Health). Research adopting technology-based learning models, such as blended learning in football, combined with integrated pedagogical strategies, is also still very

limited and rarely tested in real-world formal education contexts (Teaching football with game-based blended learning , (Ridwan 1a-E & Adil 2b-D, 2025)). While the literature demonstrates the effectiveness of certain approaches on students' motivation and technical skills, studies linking these results to national curriculum standards and comprehensive learning outcomes are still lacking (Hernández-González et al., 2025)

Educational challenges in Papua pose significant obstacles to the implementation of the football curriculum and pedagogy in schools. Access to educational services continues to face significant obstacles, such as unequal distribution of schools, a lack of sports education facilities, and difficult geographic access , which leads to low student participation in extracurricular activities, including football (Eloper et al., 2025). This is reinforced by educational statistics, which indicate that school participation rates and imbalances in teacher quality are among the main obstacles to education in Papua (Papua Provincial Education Indicators, 2023). This situation has resulted in a relatively low number of football research publications compared to other regions, as football-related pedagogical practices and curricula have not yet become a major focus in the Papuan academic community. Low teacher motivation and a lack of specific training in football pedagogy contribute to the low quality of football instruction in physical education classes (Tenório et al., 2021) . This gap highlights the need for research that specifically examines football research from a pedagogical and curriculum perspective in the culturally, geographically, and socio-economically unique context of Papua.

Therefore, this study aims to analyze the trends of football research publications from 2020 to 2025 through bibliometric analysis, focusing on the number of publications, citation trends, leading journals, key researchers, and research topic network patterns using VOSviewer. The novelty of this research lies in its specific focus on mapping football research trends using co-occurrence keyword analysis, which allows the identification of research gaps and opportunities for future studies, particularly in integrating quantitative statistical approaches with process-oriented learning research an area that has not been comprehensively explored in previous bibliometric studies on football.

METHOD

The research design used in this study is content analysis. Content analysis is a systema-

tic and objective research method used to describe and measure phenomena (Krippendorff, 2018). This method analyzes documents and allows researchers to filter words or phrases into content-related categories (Elo & Kyngäs, 2008). Simply put, a meta-review is a systematic review of original research articles. (Heal, 2009; Ruddy & House, 2005; Serenko & Bontis, 2004) This study uses bibliometric analysis, which utilizes the process of organizing ideas to visually and verbally describe and present relationships between publications and identify research trends in a field (Ganesha et al., 2019; Grimshaw et al., 2021; Pierpaoli & Ruello, 2018; Salman et al., 2022). The data were obtained from publications extracted through <https://app.dimensions.ai/> and methods. The article selection criteria in this study were as follows. Inclusion criteria: (1) articles published between 2020 and 2025; (2) articles indexed in the Dimensions database; (3) articles with the keyword "football" in the title or abstract; and (4) articles published in peer-reviewed journals. Exclusion criteria: (1) non-article publication types such as book chapters, conference proceedings, and reports; (2) articles not written in English; and (3) duplicate records. Based on these criteria, a total of 454 articles were selected as the final sample for bibliometric analysis using VOSviewer.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method (Grimshaw et al., 2021; Olina et al., 2024; Rethlefsen & Page, 2022) was used to extract articles from the database dimensions, with the topic and keywords sports in tourism. The PRISMA method is divided into 3 parts, namely: Identification, screening, study feasibility (Olina et al., 2024; Rethlefsen & Page, 2022). Initially, stage 1 (Identification), the identification section includes a box to record the number of records identified through A database search of sports terms published between 2015 and 2024 yielded 265,046 records in title and abstract. Stage 2 (screening) yielded 3,933 records by selecting the publication type "article," resulting in 876 records being excluded. Stage 3 (study eligibility) yielded a final sample of 3,057 articles.

This final sample was then analyzed using VOSviewer. VOSviewer is a computer program for creating and viewing bibliometric maps. This program is freely available to the bibliometric research community see (www.vosviewer.com). VOSviewer can be used to create author or journal maps based on co-citation data, spatial visualization, and information processing, co-authorship, and co-occurrence. Managed with VOSviewer Software or to create keyword maps

based on co-occurrence data (Kirby, 2023; van Eck & Waltman, 2010). The program offers a viewer that allows bibliometric maps to be examined in detail using fragmentation analysis with thematic and temporal trend visualization output. VOSviewer can display maps in a variety of different ways, each emphasizing a different aspect of the map. VOSviewer is used to visualize research topics and cluster analysis to identify scientific trends based on related issues.. It has functions for zooming, scrolling, and searching, which facilitate detailed map inspection (Arruda et al., 2022; Kuzior & Sira, 2022; J. Zhang et al., 2024). The PRISMA flowchart can be seen in **Figure 1**.

RESULTS AND DISCUSSION

This section describes a bibliometric analysis on the topic of football research extracted from <https://app.dimensions.ai/> in the year range from 2020 to 2025. Where bibliometric analysis is a form of meta-analysis of research data that can help researchers in studying bibliographic content and analyzing citations from articles published in journals and other scientific works (Fitria et al., 2022). In this section, the results and discussion of the analysis of the topic of water sports in tourism are described, focusing on the number of publications, number of citations, classification based on aspects (research field, journal, researcher), network visualization, overlay visualization, and density visualization (van Eck & Waltman, 2010).

Number of publications

Search for scientific article publications on the topic of football research from 2020 to 2025 resulted in 454. In 2020 to 2025 there was an increase from 2020-2024 and a decrease, in 2025, which can be presented in **Figure 1**.

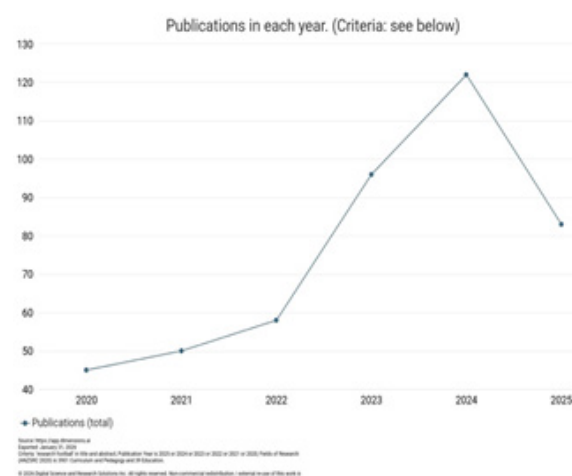


Figure 1. Number of publications on the topic of football research From 2020 to 2025

Number of citations

Bibliometric analysis provides information on rankings based on citations received (Pahwa et al., 2022). From the data on the number of citations in football research, From 2020 to 2025, there were 528 citations, with the highest number in 2025 being 210 citations, a year-on-year increase that shows an exponential increase. Furthermore, the number of citations per year is presented in **Figure 2**.

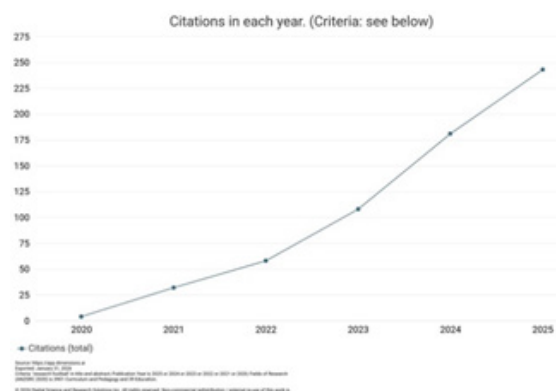


Figure 2. Number of citations for the topic of football research from 2015 to 2024

Journal

The number of publications based on the keyword of football research topic that occupies the 5 largest journals can be grouped, namely first DOAJ with 114 articles, and second ERIH PLUS journal with 63 articles, third UGC Journal LIST Group journal with 61 articles, fourth NON SPC Journal with 50 articles, fifth VABB SHW with 48 articles. This is presented in **Figure 3**.

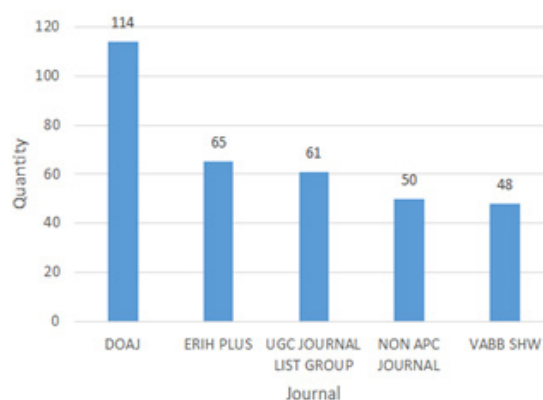


Figure 3. Number of football research publications reviewed from the journal

Researchers

The number of publications based on researchers (5 largest) can be presented, the first author is Ardi Nusri Nusri with 3 articles. Next is Ewa Malchrowicz-Mosko with 13 articles and

229 citations with an average of 17.62, while the third position is Marko Peric with 12 articles and 248 citations with an average of 20.67, fourth is Heetae Cho with 11 articles and 483 citations with an average of 43.91, Elsa Cristina Sacramento with 11 articles and 138 citations with an average of 12.55, Yun-Duk Jeong with 11 articles and 360 citations with an average of 32.73, She-ranne Fairley with 8 articles and 9 citations with an average of 18.22, Tembi Maloney Tichaawa with 9 articles and 62 citations with an average of 6.89, then Eiji Ito with 9 articles and 104 citations with an average of 11.56, last is Kostas Alexandris with 9 articles and a total of 114 citations with an average of 12.67, based on that, the research related to sports in tourism can be presented in **Figure 4**.

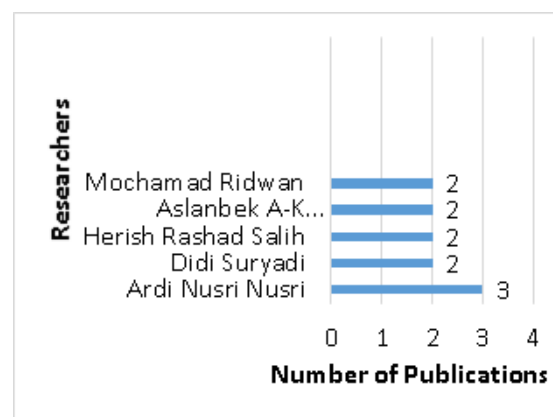


Figure 4. Number of publications on football research topics reviewed by researchers

Network visualization for co-occurrence

VOSviewer provides network visualization maps for co-occurrence, there are 49 items, 3 clusters, 890 links, and total link strength 3726. Next, it consists of cluster 1 (22 items), namely, academic year, basic football skills, boy, college, control group, educational unit, effect, experimental group, experimental method, minute, nature, number, period, post test, program, research community, research sample, researcher, sample, spss, time, week. Cluster 2 (19 items) article, basketball background, coach, content, data collection, experience, interest, interview, knowledge, objective, observation, paper, participant, process, role, value, work. Cluster 3 (8 items) isti action, cycle, increase, outcome, percentage, population, soccer game as seen in **Figure 5**. The network visualization in **Figure 5** shows the relationship between the occurrence of terms in the titles and abstracts of research articles. Two terms connected by a line indicate that they appear simultaneously in both the title and abstract,

cates that these topics have been the main focus in previous research. In contrast, terms such as basketball, football game, cycle, and percentage tend to be in the green to blue areas, indicating a lower level of research density and are still relatively rarely studied. Thus, further research opportunities can be directed at developing studies that link these low-density terms into the context of experimental or learning research, as shown in **Figure 7**.

Issues regarding social and cultural values, management and development of sports facilities, ethics in sports, and its impact on society make the study of football not only seen as a physical activity, but also as a social and economic phenomenon (Giulianotti & Robertson, 2004). Football is defined as a sporting activity involving individuals or groups who participate actively or passively, both in competitive and recreational contexts, and has close links with education, communities, and the sports industry (Karen & Dunning, 2002). In various studies, football has also been shown to contribute to social and economic development through the development of athlete development, increased community participation, and the growth of the sports industry and sporting events (Hoye et al., 2009). Therefore, the study of football research needs to be narrowed down not only to aspects of match performance and athletes, but also include the role of coaches, educational institutions, communities, and community-based sports development programs. For researchers, bibliometric analysis plays an important role in identifying dominant themes, research trends, and opportunities for novelty in the football research domain. With the help of visualization tools such as VOSviewer, bibliometric analysis is able to manage large amounts of unstructured scientific data and present it in the form of factual and objective information based on citation metrics, thus supporting the development of football research directions systematically and sustainably (Lam et al., 2022a).

Based on the results of bibliometric analysis using VOSviewer, the network visualization map for co-occurrence analysis shows that there are 49 items, 3 clusters, 890 links, and a total link strength of 3726. This network visualization represents the relationship between the co-occurrence of terms contained in the title and abstract of research articles. Two terms connected by a line indicate that the terms often appear together, while terms that are not connected to each other indicate no simultaneous occurrence in the same document. Therefore, this network visualization

can be used to identify research areas that have been widely studied as well as research gaps that are still open (Lam et al., 2022a).

The first cluster consists of 22 items, namely academic year, basic football skill, boy, college, control group, educational unit, effect, experimental group, experimental method, minute, nature, number, period, post test, program, research community, research sample, researcher, sample, SPSS, time, week. The dominance of these terms indicates a strong tendency for research to use an experimental quantitative approach, with statistical analysis as the primary tool for measuring the effectiveness of learning programs. This is reinforced by the strong association between the terms SPSS with post test, sample, experimental group, and effect, which indicates the use of experimental design and intensive statistical data processing in previous studies.

The second cluster consists of 19 items: article, basketball background, coach, content, data collection, experience, interest, interview, knowledge, objective, observation, paper, participant, process, role, value, and work. This cluster reflects the research focus on aspects of the learning process, participant experience, the role of the coach or teacher, and the values and context of learning, which are generally analyzed using a qualitative or mixed approach. Terms such as process, experience, and value are more closely related to content, knowledge, and participant, emphasizing attention to the dynamics of learning and learning experiences.

Meanwhile, the third cluster consists of 8 items, namely satisfaction, cycle, increase, outcome, percentage, population, and soccer game. This cluster shows studies oriented towards learning outcomes and performance changes, but with a relatively lower intensity of association compared to the other two clusters. Interestingly, the term process does not show a strong connection with SPSS or experimental method, which indicates the opportunity for research novelty by integrating quantitative statistical analysis using SPSS into studies that emphasize the process and learning experience, especially in the context of physical education and soccer.

In addition, VOSviewer also displays a density visualization map for co-occurrence analysis of 49 terms used in the research domain. This density visualization depicts the level of research density through color gradation, where yellow is the color indicates terms with high weight and density that have been extensively researched, while green to blue indicates terms with lower density. Based on the visualization, terms such as sample, effect, experimental group, program, and

process are in the yellow area, which indicates that these topics have been the main focus of previous research. In contrast, terms such as basketball, football game, cycle, and percentage tend to be in the green to blue areas, indicating that these topics are still relatively rarely studied. Thus, further research can be directed at developing studies that link these low-density terms into the context of experimental research and learning to produce more innovative scientific contributions.

CONCLUSION

Based on the analysis of 454 articles, several key conclusions can be drawn. Football research publications showed a consistent upward trend from 2020 to 2024, with a slight decrease in 2025, indicating that academic interest in football continues to grow.

Citation analysis revealed a total of 528 citations, with 2025 recording the highest number (210 citations), reflecting the increasing academic influence of recent football research.

In terms of journal distribution, DOAJ-indexed journals led with 114 articles, followed by ERIH PLUS (63 articles) and UGC Journal List Group (61 articles), demonstrating the breadth of publication venues in this field.

Network visualization identified three distinct research clusters: a quantitative-experimental cluster dominated by terms such as SPSS, experimental group, post-test, and effect; a qualitative-process cluster centered on experience, value, and process; and an outcome-oriented cluster. The absence of a strong connection between the experimental and process clusters reveals an important research gap and novelty opportunity namely, the integration of quantitative statistical methods with process-oriented and experiential learning research in the context of physical education.

Overlay visualization confirmed that experimental and statistical approaches represent the most current and actively growing research trends, while density visualization highlighted that terms such as basketball, football game, cycle, and percentage remain underexplored. In conclusion, this study maps the landscape of football research and identifies clear directions for future research, particularly toward integrating innovative learning approaches with rigorous statistical analysis to advance the quality and relevance of football research in physical education contexts.

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