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Mapping Basketball Research in Physical Education and Sport Sciences: A Systematic Literature Review

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ABSTRACT

Background & objective: This study aimed to systematically map the development, thematic orientation, and methodological evolution of basketball research within physical education and sport sciences during 2015–2025, while identifying research gaps and future directions.

Materials & Methods: A PRISMA-guided systematic literature review was conducted using searches across Scopus, Web of Science, PubMed, ERIC, SPORTDiscus, Google Scholar, and selected Indonesian university repositories (January 2015–December 2025). Eligibility criteria prioritized peer-reviewed articles and high-quality theses with clear methodologies and explicit educational/pedagogical relevance. Data were extracted using a standardized form (e.g., context, participants, design, theoretical framing, thematic focus, and key findings). Quantitative synthesis used bibliometric analysis and VOSviewer network mapping, while qualitative synthesis applied content analysis (deductive–inductive coding). Findings were integrated through a convergent mixed synthesis approach.

Results: The search identified 8,764 records; after duplicate removal, 6,412 records were screened. A total of 1,247 studies were included for bibliometric analysis, and 89 studies met criteria for in-depth qualitative synthesis. Quantitative designs dominated (64.2%), followed by qualitative (17.6%), mixed methods (16.9%), and review-based studies (1.3%). The synthesis revealed six major thematic clusters: technical skill development, pedagogical innovation, biomechanical performance analysis, psychological factors, technology-based learning, and program evaluation/assessment. Overall trends indicate a shift from performance-focused traditions toward learner-centered, evidence-based, technology-supported, and context-sensitive research, including notable contributions from Indonesia (8.9% of included studies).

Conclusions: Basketball research in physical education and sport sciences expanded substantially from 2015–2025 and matured into a more holistic and methodologically plural field. Future research should strengthen cross-cultural representation, refine standardized outcome measures, and increase implementation-focused studies that account for contextual constraints (e.g., resources, teacher capacity, and cultural norms).

Keywords

physical education; sport sciences; bibliometric analysis; systematic literature review; pedagogy; technology-supported learning.

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INTRODUCTION

Global and Theoretical Context

Basketball occupies an important position at the intersection of physical education, sport science, and movement learning, providing opportunities to examine motor competence, tactical decision-making, cooperation, communication, and psychosocial development. These outcomes depend not only on physical capacities but also on instructional design, feedback, meaningful participation, and social conditions. Accordingly, basketball research spans interconnected domains, including technical skill acquisition, pedagogical innovation, biomechanics, sport psychology, educational technology, and curriculum assessment. Motor-learning theories emphasize practice, feedback, and experience, while ecological dynamics approaches highlight interactions among learners, task demands, and environmental constraints (Rudd et al., 2020; He et al., 2023; Sofyan et al., 2022; Tani et al., 2014; Loland et al., 2023; Alali et al., 2024). Together, these perspectives support an integrated understanding of basketball skill development, instructional processes, and learner experience.

Digital technologies, including video-based feedback, mobile applications, wearable sensors, and data-supported assessment, have further expanded opportunities to monitor performance, support reflection, and individualize instruction. However, their educational value depends on instructional purpose, implementation quality, teacher competence, accessibility, and contextual suitability rather than technological innovation alone (Martín-Rodríguez & Madrigal-Cerezo, 2025; Mokmin et al., 2025). Psychological and sociocultural factors, such as motivation, self-efficacy, teamwork, cultural expectations, and resource availability, also shape how basketball is taught, learned, and researched. Therefore, understanding the development of basketball research requires examining the connections among performance, pedagogy, technology, and learner experience across diverse educational contexts.

Critical Overview of Existing Evidence

Existing basketball research examines technical skill development, biomechanics, pedagogy, and educational outcomes, although the depth and educational relevance of

evidence vary across domains. Studies of movement efficiency, shooting, dribbling, and physical capacities provide insights into skill execution, but performance improvements do not necessarily demonstrate teaching effectiveness or student learning (Majeed, 2023; Shang et al., 2025). Similarly, instructional approaches differ in their emphasis on technical practice, tactical problem-solving, student autonomy, and collaboration, requiring evaluations that consider participant characteristics, learning environments, assessment methods, and intervention duration (He et al., 2023; Alali et al., 2024). Psychological, technological, and contextual research further addresses motivation, self-efficacy, teamwork, digital feedback, and culturally responsive instruction, but differences in theoretical perspectives, research designs, and outcome measures limit direct comparisons. The value of digital tools also depends on infrastructure, teacher expertise, and available resources; therefore, prominent research themes should not automatically be interpreted as evidence of effectiveness or universal applicability.

Methodological diversity provides complementary insights but complicates evidence synthesis. Quantitative studies examine relationships and performance changes, qualitative studies explore experiences and instructional processes, and mixed-methods research may integrate both perspectives. Nevertheless, differences in sampling, measurement, analysis, and reporting can limit comparability. Bibliometric analysis identifies publication trends, collaboration networks, and keyword associations, but these indicators do not directly establish research quality or intervention effectiveness. Furthermore, database coverage, language restrictions, publication bias, and uneven geographical representation may influence the apparent distribution of evidence. These limitations highlight the importance of combining research mapping with critical appraisal of study characteristics and educational implications.

Previous Reviews and the Unresolved Gap

Previous reviews have examined specific aspects of basketball and physical education research. Sofyan et al. (2022) investigated historical publication trends in basketball research, while Shang et al. (2025) used bibliometric methods to examine growth and maturation among basketball players. Other reviews addressed basketball training and physical fitness among primary school students (Lyu & Leethong-in, 2025), sport biomechanics (Kumar & Das, 2024), and trends in physical education practices (Hernández-González et al., 2025). Related work has synthesized educational practices and student outcomes in school physical education (He et al., 2023) and explored sport and exercise psychology (Latinjak & Hatzigeorgiadis, 2021). Although these studies provide valuable evidence and methodological insights, their specific scopes do not necessarily integrate the pedagogical, technical, psychological, biomechanical, technological, and evaluative dimensions of basketball research within physical education and sport sciences.

The unresolved gap is therefore the need to connect the structure of the published literature with the methodological characteristics of individual studies and the educational implications of their findings. Without this integration, it remains

difficult to understand how research priorities evolve, how different subdisciplines relate to one another, and whether geographical and educational contexts are adequately represented. Addressing these questions is important for developing research agendas relevant to diverse institutional and cultural settings. However, the novelty of an updated review covering January 2015 to December 2025 should be established through a documented comparison of previous reviews' search periods, databases, eligibility criteria, and analytical approaches. Accordingly, the present review combines bibliometric mapping with qualitative synthesis to examine publication patterns and substantive research findings, identify convergences and gaps, and distinguish research visibility from educational relevance and evidential strength.

Novelty and International Contribution

The principal contribution of this review is its integration of bibliometric mapping and qualitative content analysis to examine basketball research in physical education and sport sciences from 2015 to 2025. Bibliometric analysis characterizes publication trends, methodological and geographical distributions, and thematic relationships, while qualitative synthesis examines educational settings, research designs, theoretical perspectives, findings, and implications. By addressing complementary analytical questions, this approach aims to provide a more comprehensive understanding of the field than either method alone, subject to transparent reporting of datasets, coding procedures, and analytical outputs.

The review organizes the literature into six interconnected domains: technical skill development, pedagogical innovation, biomechanical performance analysis, psychological factors, technology-supported learning, and program evaluation and assessment. This framework supports examination of research priorities and the connections between performance, learner-centered approaches, and educational contexts without assuming a linear progression or predetermined hierarchy. Furthermore, analysis of geographical representation, research designs, and educational settings can reveal potential gaps in the evidence base. These insights may inform an international research agenda emphasizing comparable outcome measures, stronger methodological reporting, cross-context collaboration, and contextual sensitivity, while ensuring that conclusions remain proportionate to the evidence identified and assessed.

Review Objective and Review Questions

This systematic literature review aimed to map the thematic, methodological, and geographical characteristics of basketball research in physical education and sport sciences published between 2015 and 2025. By integrating bibliometric analysis with qualitative synthesis, the review addressed four questions concerning research methods and geographical distribution (RQ1), dominant thematic areas (RQ2), the characteristics and methodological quality of 89 qualitatively synthesized studies (RQ3), and educational implications, methodological limitations, and future research priorities (RQ4). These questions guided the analysis and ensured alignment between the review objectives, methods, and findings.

MATERIALS METHODS

Review Design and Reporting Guideline

This study employed a systematic literature review (SLR) combining bibliometric analysis and qualitative content analysis to examine basketball research in physical education and sport sciences published between 2015 and 2025. Guided by the

PRISMA 2020 reporting framework, the review mapped publication characteristics, thematic patterns, research methodologies, educational contexts, and implications of the included studies. Bibliometric analysis characterized the overall research landscape, while qualitative synthesis explored

substantive findings and educational implications. PRISMA was used to support transparent reporting rather than as a measure of review quality. The available manuscript does not establish whether a review protocol was prepared or registered; therefore, this information should be verified and explicitly reported, including any protocol deviations if applicable.

Eligibility Criteria

Eligibility criteria were established to identify studies

addressing basketball within educational, pedagogical, or training contexts. The review prioritized peer-reviewed journal articles and academic theses with identifiable methodologies and findings relevant to learning, teaching, skill development, or program evaluation. Studies focusing exclusively on elite athletic performance or clinical rehabilitation without an explicit educational connection were excluded. The eligibility framework is summarized in Table 1.

Table 1. Eligibility criteria for the systematic literature review

Criterion	Inclusion criteria	Exclusion criteria
Research topic	Basketball research relevant to physical education, pedagogy, learning, skill development, or educationally relevant training	Basketball research without a relevant educational or pedagogical connection
Context	School, university, educational, pedagogical, or relevant training settings	Clinical rehabilitation or elite performance research without educational relevance
Publication period	January 2015–December 2025	Publications outside the specified period
Publication type	Peer-reviewed journal articles and academic theses meeting the stated methodological criteria	Conference abstracts, editorials, opinion papers, and duplicate or redundant records
Research design	Studies reporting identifiable methods and findings relevant to the review objectives	Studies lacking sufficient methodological information or empirical relevance
Full-text availability	Full text available for comprehensive assessment	Full text unavailable for comprehensive assessment
Language	Not explicitly specified in the available manuscript; the actual language restrictions must be verified	Must be defined according to the restrictions actually applied during screening
Outcomes and themes	Findings relevant to learning, teaching, skill development, research methods, or program evaluation	Findings outside the review scope

These limitations should be considered when interpreting the geographical and methodological patterns. In addition, the term “high-quality academic theses” requires an explicit operational definition, including the criteria used to assess thesis quality and whether eligibility standards were applied consistently across publication types.

Information Sources

The review searched Scopus, Web of Science, PubMed, ERIC, SPORTDiscus, Google Scholar, and selected Indonesian university repositories to identify relevant literature published between January 2015 and December 2025. These sources were selected to cover sport sciences, physical education, educational research, health-related research, and regional academic literature. However, the exact search dates, database platforms, repository coverage, and applied filters were not fully documented in the available manuscript and must be verified using the original search records. Similarly, backward and forward citation searching, expert consultation, and manual journal searching should be reported only if they were conducted. To improve reproducibility, the final review should provide a source-specific search log documenting the platform, search date, coverage period, filters, and number of records retrieved for each source.

Search Strategy

The search strategy aimed to identify literature connecting basketball with physical education, sport pedagogy, learning, and educational research. The representative Scopus search string reported in the original manuscript was (“basketball” OR “bola basket”) AND (“physical education” OR “sport pedagogy” OR “learning” OR “education”) AND (“research” OR “study” OR “investigation”). Although the search terms were adapted to different database indexing systems, the available manuscript does not provide complete, reproducible search strings for all sources or confirm the exact syntax, fields, filters, and retrieval counts used. The final report should therefore verify these details against the original search histories and provide the complete database-specific queries in supplementary material, including search fields, controlled vocabulary where applicable, filters, search dates, and records retrieved. The use of truncation, proximity operators, subject headings, or librarian review should

be reported only if confirmed by the original records.

Study Selection and Screening

The study-selection process comprised identification, deduplication, title and abstract screening, full-text assessment, and final inclusion. The original manuscript reports 8,764 records; however, inconsistencies between the narrative and Figure 1 prevent verification of the selection counts. The process must therefore be reconstructed from the original database exports, deduplication records, screening decisions, and full-text exclusion log. The final report should specify the procedures and software used at each stage, the number of reviewers, whether screening was conducted independently, how disagreements were resolved, and any calibration procedures undertaken. Reasons for full-text exclusions should be reported with their corresponding counts. Once verified, the selection process should be presented in a PRISMA 2020 flow diagram with internally consistent figures that distinguish records, reports, and studies where applicable. Unverified counts, software, or reviewer procedures should not be inferred or added retrospectively.

Data Extraction and Data Items

Data were extracted using a standardized form designed to capture bibliographic, methodological, contextual, and substantive characteristics of eligible studies, including authorship and publication year, country and institutional affiliation, research design, study setting, sample characteristics, theoretical framework, thematic focus, key findings, and educational implications. These variables supported the characterization of the literature and the qualitative synthesis. However, the available manuscript does not specify whether the extraction form was pilot-tested, how many reviewers conducted extraction, or whether independent extraction and verification procedures were used; these details should be confirmed from the original research records. Missing or unclear information should be handled transparently, and additional variables should be reported only if they were actually collected or can be reliably recovered. The extraction dataset should distinguish information collected for the full bibliometric corpus from variables extracted specifically for the 89 studies included in the qualitative synthesis. Where possible, the extraction form and corresponding data

should be provided as supplementary material to improve transparency and reproducibility.

Quality Appraisal or Risk of Bias

The original manuscript reports that the Critical Appraisal Skills Programme (CASP) and the qualitative domain of the Mixed Methods Appraisal Tool (MMAT) were used to assess the methodological quality of studies included in the qualitative synthesis, with 63.0% classified as high quality and 37.0% as moderate quality. However, the available documentation does not specify which instrument was applied to each study, the versions and criteria used, the procedures for deriving quality ratings, or the number of reviewers involved. These details, including whether assessments were conducted independently and how disagreements were resolved, must be verified against the original appraisal records. The operational definitions of the quality categories and the influence of appraisal findings on the synthesis should also be clarified, as CASP and MMAT are not interchangeable instruments. The reported percentages should be retained only if supported by the underlying records, preferably accompanied by study-level or domain-level results in supplementary material. If appraisal findings did not inform the interpretation of the synthesis, this limitation should be explicitly acknowledged.

Synthesis and Analysis

The review integrated bibliometric analysis using VOSviewer with qualitative content analysis of 89 studies to examine methodological and geographical patterns, six thematic domains, and educational implications in basketball research. Qualitative synthesis employed deductive and inductive coding, while the integration of both approaches aimed to identify convergences and divergences across findings. Because the review focused on research mapping rather than estimating intervention effects, meta-analysis was not required. However, bibliometric procedures, coding processes, and reviewer agreement require clearer documentation for reproducibility, and reported percentages and thematic classifications should be verified against the original datasets, particularly where thematic categories may overlap.

RESULTS

PRISMA Flowchart and Study Selection

The systematic search identified 8,764 records across Scopus, Web of Science, PubMed, ERIC, SPORTDiscus, Google Scholar, and selected national repositories for the period 2015–2025. Following duplicate removal, 6,412 records remained for

Certainty or Confidence in the Evidence

The review did not report a formal assessment of certainty or confidence in the synthesized evidence using frameworks such as GRADE or GRADE-CERQual. Although the methodological quality of studies in the qualitative subset was reportedly assessed using CASP and the qualitative domain of MMAT, these appraisals do not independently establish the certainty of the review's conclusions. Given the heterogeneous study designs and the combination of bibliometric mapping and qualitative synthesis, findings should be interpreted according to the type and strength of the available evidence, distinguishing descriptive research patterns from conclusions about educational practices and outcomes. The absence of a formal certainty assessment should therefore be acknowledged as a limitation. Future review updates may consider GRADE-CERQual for appropriate qualitative synthesis questions, provided its application is justified by the review design and available evidence.

Ethics, Data, Materials, and Code Availability

This review analyzed published literature and bibliographic information without collecting new data from human participants; therefore, institutional ethical approval was considered unnecessary, subject to applicable institutional and journal requirements. To support transparency and reproducibility, relevant materials include the complete search strategies and logs, screening criteria, full-text exclusion records, data-extraction form, extracted bibliographic dataset, qualitative coding framework, quality-appraisal records, and VOSviewer files, where available and appropriate for sharing. As the available manuscript does not identify a verifiable public repository or persistent identifier for these materials, no claim of public availability or repository deposition can be made without confirmation. The final manuscript should specify the actual availability of each relevant material, provide an authentic repository link or DOI if applicable, and transparently describe any access conditions or restrictions. All supplementary materials should also be checked for consistency with the final methods and results.

title and abstract screening, of which 4,985 were excluded because they were irrelevant to basketball education, lacked a pedagogical focus, or did not provide sufficient methodological clarity. The remaining 1,427 full-text articles were assessed for eligibility, and 180 were excluded for reasons including a non-educational focus, incomplete data, or methodological limitations.

Table 1. Summary of Included Qualitative Studies (n = 89)

Category	Description
Total qualitative studies	89
Publication period	2015–2025
Study contexts	School-based physical education (47.2%); University sport education (29.2%); Coach education and training programs (23.6%)
Educational level	Primary education (21.3%); Secondary education (38.2%); Higher education (27.0%); Mixed levels (13.5%)
Geographic distribution	Asia (41.6%); Europe (28.1%); North America (19.1%); Oceania & others (11.2%)
Dominant research designs	Case study; phenomenology; action research; ethnography
Primary data collection methods	Interviews; classroom observations; reflective journals; document analysis
Quality appraisal tools	CASP; MMAT qualitative domain
Overall methodological quality	High (63.0%); Moderate (37.0%)

Consequently, 1,247 studies were deemed appropriate and included in the bibliometric analysis, while 89 studies met the criteria for in-depth qualitative synthesis. Figure 1 illustrates the

PRISMA flow diagram detailing each stage of the study selection process.

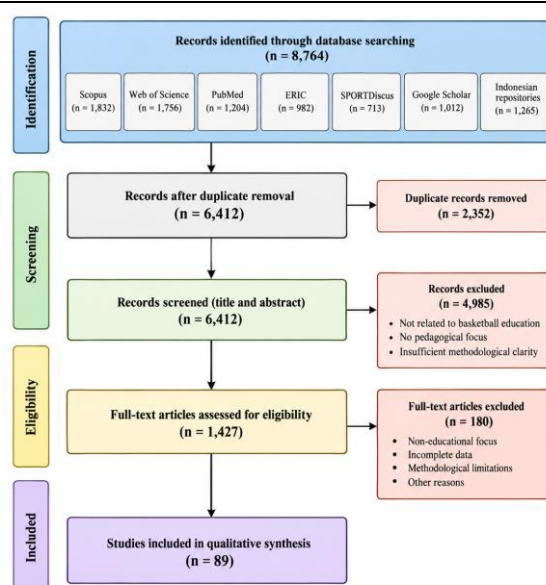


Figure 1. PRISMA flow diagram of the study selection process: The diagram presents the identification, screening, eligibility assessment, and final inclusion of studies in the systematic review of basketball research in physical education and sport sciences.

Characteristics of Included Studies

Data extraction from the included studies focused on the following attributes: publication year, country and institutional affiliation, research design, methodological approach, thematic focus, educational context, and reported outcomes.

Table 2. Characteristics of Included Qualitative Studies by Thematic Focus

Thematic Focus	Number of Studies (n)	Main Research Emphasis	Key Educational Implications
Technical skill development	18	Skill acquisition, motor learning processes	Supports structured practice and feedback-based instruction
Pedagogical innovation	21	Teaching models, instructional strategies	Enhances student engagement and tactical understanding
Psychological factors	16	Motivation, confidence, teamwork	Highlights role of affective learning in PE
Technology-supported learning	14	Video analysis, digital tools, blended learning	Enables personalized and reflective learning
Cultural & contextual adaptation	12	Local values, contextual constraints	Emphasizes culturally responsive pedagogy
Program evaluation & assessment	8	Curriculum effectiveness, assessment methods	Informs evidence-based curriculum design

The analyzed literature demonstrates broad geographic representation, with studies originating predominantly from North America (34.7%), Europe (28.4%), and Asia (22.6%), including a notable contribution from Indonesia (8.9%). This distribution reflects the global relevance of basketball as a medium for physical education and sport science research.

Table 3. Data Extraction Domains from Included Qualitative Studies

Extraction Domain	Description
Authors & year	Identification and publication chronology
Country / region	Sociocultural and educational context
Research aim	Focus and research questions
Participants	Students, teachers, coaches, or mixed groups
Educational setting	School, university, or training environment
Methodology	Qualitative approach and design
Data sources	Interviews, observations, documents
Key findings	Main results related to learning and teaching
Educational implications	Relevance for practice and policy

The qualitative synthesis of 89 studies demonstrates a clear shift toward learner-centered and context-sensitive approaches in basketball education research. Most studies emphasize pedagogical innovation, psychological engagement, and technology-supported learning, reflecting an expanded understanding of basketball as a holistic educational medium. Cultural adaptation emerges as a prominent theme, particularly in Asian contexts, underscoring the importance of contextual relevance in physical education research.

Methodological Distribution of Analyzed Studies

Among the 1,247 studies included in the bibliometric analysis, quantitative research designs dominated (64.2%), followed by qualitative approaches (17.6%), mixed methods studies

(16.9%), and review-based investigations (1.3%). The increasing proportion of mixed methods research over time indicates a shift toward integrative approaches aimed at capturing the complexity of learning processes, instructional practices, and contextual influences in basketball education.

Thematic Outcomes and Analytical Grouping

The synthesis identified six major thematic clusters in basketball research: technical skill development (31.4%), focusing on motor learning, skill acquisition, and performance improvement through structured practice and task-specific feedback; pedagogical innovation (28.6%), addressing instructional models, curriculum design, student engagement, tactical understanding, and motivation; and biomechanical

performance analysis (23.8%), examining movement efficiency, technique optimization, and injury prevention. The remaining clusters comprised psychological factors in learning (22.1%), including motivation, self-efficacy, teamwork, and mental skills; technology-based learning (19.7%), covering video analysis, mobile applications, wearable sensors, and artificial intelligence; and program evaluation and assessment (16.3%), emphasizing instructional effectiveness, learning outcomes, and program quality. Collectively, these themes highlight the diversity of basketball research and the relevance of integrating skill development, pedagogy, biomechanics, psychological processes, technology, and systematic assessment. Because thematic percentages may overlap, they should not be interpreted as mutually exclusive categories unless this is confirmed by the underlying coding procedures.

This figure presents a VOSviewer-based bibliometric network visualization showing topic clusters derived from keyword co-occurrence analysis. Node size represents the prominence of an item (e.g., keyword frequency), while link thickness indicates the

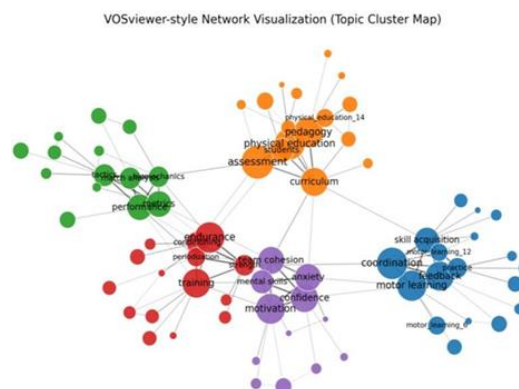


Figure 2. VOSviewer Network Visualization of Topic Clusters (Keyword Co-occurrence Map)

strength of association between items (co-occurrence/link strength). Colors denote different clusters, highlighting groups of closely related themes and revealing the main thematic structure of the research field.

DISCUSSION

Principal Findings

This systematic literature review mapped the thematic, methodological, and geographical characteristics of basketball research in physical education and sport sciences from 2015 to 2025. Three principal findings emerged: quantitative research predominated (64.2%), the literature covered interconnected performance-related and educational themes, and the qualitative synthesis of 89 studies highlighted the relevance of educational contexts and methodological diversity. Qualitative (17.6%) and mixed-methods studies (16.9%) complemented quantitative approaches by addressing learning experiences, instructional processes, and contextual influences, whereas review-based studies accounted for 1.3% of the bibliometric corpus. The thematic findings encompassed technical skill development, pedagogical innovation, biomechanical performance analysis, psychological factors, technology-supported learning, and program evaluation and assessment. Together, these patterns indicate that basketball research extends beyond technical performance to broader questions of teaching, learning, learner engagement, and educational assessment. However, methodological proportions describe the composition of the identified literature rather than the relative effectiveness of research approaches, and thematic percentages require cautious interpretation because category overlap and denominators remain to be clarified. Although the 89-study qualitative synthesis provides insights across educational settings, participant levels, research designs, and data collection methods, heterogeneity in study characteristics limits direct comparison and prevents definitive conclusions about educational effectiveness. Overall, the findings portray basketball research as a multidisciplinary field with substantial pedagogical relevance, while underscoring the need for greater methodological comparability, clearer contextual analysis, and more transparent reporting.

Comparison with Previous Reviews and International Evidence

Previous reviews have documented the expansion and diversification of basketball, sport science, and physical education research (Carlos et al., 2023; Triansyah et al., 2025). The present review extends this work by integrating bibliometric patterns with qualitative evidence on educational contexts, methodologies, and thematic priorities. Its findings align with

broader research highlighting the cognitive, psychological, social, and contextual dimensions of learning, as well as the connections between movement science, skill acquisition, and instructional practice (Hernández-González et al., 2025; Latinjak & Hatzigeorgiadis, 2021; Qian et al., 2025; Loland et al., 2023; Patiño et al., 2023). The prominence of pedagogical innovation also reflects the importance of instructional design, student engagement, and active participation (He et al., 2023; Alvarez-Bell et al., 2017). However, these findings do not establish the superiority of any particular instructional model, which requires rigorous comparisons using compatible outcome measures.

The visibility of technology-supported learning is consistent with broader developments in physical education and educational technology (Martín-Rodríguez & Madrigal-Cerezo, 2025; Mokmin et al., 2025), although its practical value depends on infrastructure, teacher competence, and implementation conditions. Contributions from Asia and Indonesia highlight the relevance of research beyond Western settings, but regional representation may be influenced by database coverage, language, publication accessibility, and institutional research capacity. Differences from previous reviews may also reflect variations in search periods, eligibility criteria, populations, and analytical methods. Therefore, publication frequency should not be equated with research prevalence or educational effectiveness. Further comparative research is needed to examine how local conditions shape research priorities and influence the transferability of instructional practices across contexts (Scheiner, 2024; Zarya et al., 2023).

Implications

The findings support a multidimensional understanding of basketball research that connects motor learning, pedagogy, psychological processes, biomechanics, technology, and educational assessment. This perspective highlights interactions among learners, instructional tasks, movement environments, and social contexts (Alali et al., 2024; Jones et al., 2023). Accordingly, technical proficiency should be considered alongside feedback, tactical decision-making, and learner engagement, while technology-supported learning should reflect instructional objectives, teacher competence, and available resources (Martín-Rodríguez & Madrigal-Cerezo, 2025; Mokmin et al., 2025). A provisional conceptual model linking instructional

design, learner processes, feedback and assessment, and contextual conditions may guide future research, although its proposed relationships require empirical validation.

Methodologically, the findings highlight the need for stronger research rigor, comparability, and transparency. Researchers should use clearly defined outcomes, report instrument reliability and validity, and select designs appropriate to their research questions. Comparative and controlled studies can examine instructional effects, longitudinal designs can assess retention and transfer, and qualitative or mixed-methods approaches can clarify learning experiences and implementation processes. Transparent reporting of sampling, interventions, analytical procedures, and missing-data handling is also essential. Bibliometric analyses should document data sources and analytical parameters, while qualitative syntheses should explain coding frameworks and reviewer procedures. Distinguishing keyword co-occurrence patterns from themes derived through full-text analysis can further improve interpretation and reproducibility.

Practically, the findings may inform teachers, curriculum developers, coaches, and policymakers, although they do not establish the universal effectiveness of particular instructional approaches. Teaching can integrate skill practice, feedback, tactical decision-making, and learner participation according to students' abilities and educational objectives (Alvarez-Bell et al., 2017; McCubbins et al., 2018). Assessment may also consider tactical understanding, teamwork, and reflection (Lyu & Leethong-in, 2025; Wang et al., 2025). Technology adoption should account for costs, infrastructure, teacher training, accessibility, and data privacy (Thapaliya & Panta, 2025), while instructional models should be adapted to local facilities, class sizes, teacher preparation, and cultural expectations (Scheiner, 2024; Zarya et al., 2023). Institutional investment in professional development, research collaboration, and appropriate assessment tools may strengthen evidence-informed practice, provided that recommendations are evaluated within their local contexts.

Strengths and Limitations

A key strength of this review is its integration of bibliometric

mapping and qualitative content analysis to examine basketball research published between 2015 and 2025, drawing on multiple international databases and Indonesian university repositories. However, database coverage, publication accessibility, potential language restrictions, and full-text availability may have affected study and geographical representation. The review period also provides a contemporary overview rather than a complete historical account, while heterogeneity in research designs, populations, outcome measures, and educational settings limits direct comparisons. Incomplete reporting of bibliometric parameters, coding procedures, and CASP and MMAT applications further restricts reproducibility, while the absence of formal assessments of evidence certainty and publication bias limits confidence in substantive conclusions. In addition, inconsistencies in study-selection counts and thematic denominators must be resolved against the original records before quantitative findings can be considered definitive. Therefore, the results should be interpreted as a structured overview of the identified literature rather than conclusive evidence of instructional effectiveness or a complete representation of global basketball education research.

Future Research Agenda

Future research should prioritize six areas: improving methodological transparency and reproducibility; standardizing technical, tactical, psychological, and educational outcome measures; conducting rigorous comparative and longitudinal studies; expanding geographical and cultural representation; testing theoretically grounded relationships among instructional design, feedback, psychological processes, and environmental conditions; and evaluating implementation feasibility, resource requirements, equity, and cost-effectiveness. Greater collaboration across motor learning, sport pedagogy, and implementation research could strengthen cumulative evidence and support meaningful international comparisons. These priorities should be interpreted as recommendations derived from the review's identified patterns and limitations, rather than as a formally validated ranking of research needs.

CONCLUSION

This review mapped basketball research in physical education and sport sciences from 2015 to 2025, identifying its methodological characteristics, geographical distribution, major themes, and educational implications. By integrating bibliometric mapping with qualitative synthesis, it highlights research on technical skill development, pedagogical innovation, biomechanics, psychological factors, technology-supported learning, and program evaluation, while identifying opportunities to strengthen theoretical integration, methodological transparency, and international collaboration. The findings may

inform context-sensitive educational practices, although variations in research designs, outcome measures, geographical representation, and reporting quality limit conclusions about instructional effectiveness. Future research should prioritize rigorous comparative and longitudinal designs, standardized outcome measures, broader international representation, and systematic evaluation of educational implementation, alongside resolving inconsistencies in study-selection reporting and thematic denominators to improve reproducibility and reliability.

DECLARATIONS

Consent for Publication

Not applicable. This manuscript does not report identifiable individual-level data or personal information requiring consent for publication.

Author Contributions – CRediT

Imanuddin Siregar: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, and Writing – Original Draft Preparation.

Joko Priono: Methodology, Validation, Investigation, and Writing – Review & Editing.

Arief Rahman: Validation, Supervision, and Writing – Review & Editing

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Conflict of Interest

The authors declare that they have no financial, personal, or institutional relationships that could have inappropriately influenced the conduct, analysis, interpretation, or reporting of this study.

Data Availability

The data analyzed in this review were derived from published articles and academic sources identified through the literature search. The

extracted data and bibliometric analysis files should be made available by the corresponding author upon reasonable request, subject to applicable copyright and database-access restrictions.

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Generative AI Disclosure

The authors declare that no generative artificial intelligence tools were used in the preparation of this manuscript.

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