



Reviews. Questioning in Physical Education and sports: a scoping review
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Questioning in Physical Education and sports: a scoping review

El cuestionamiento en la Educación Física y el deporte: una revisión de alcance

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Author contribution: E-MF and KE conceptualized the paper, designed the study. E-MF conducted the literature search and screened all articles at both the title, abstract and full articles. KE assisted with the screening and worked with E-MF to select the articles for inclusion in the review. Preliminary data extraction of these articles was conducted by E-MF and checked by KE, AP, VD and OK. The quality assessment of all included articles was conducted by E-MF, KE and AP while disagreements resolved by VD and OK. E-MF wrote the draft of the manuscript, the tables and figures and initial feedback was provided by KE. Before submission, all authors read and approved the final version of the manuscript.

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Abstract

Questioning is an essential pedagogical tool, yet its practical application in Physical Education (PE) and sports is often superficial. This scoping review aimed to synthesize evidence on the use of questioning by teachers and coaches, examining patterns, effects, and methodological factors. Following PRISMA-ScR guidelines, 34 studies were selected from Scopus, ERIC, Taylor & Francis, and MDPI databases. JBI and MMAT tools were used for the methodological mapping of the studies and to improve the interpretation of findings. The analysis revealed a predominance of lower-order cognitive questions (knowledge and comprehension) across both contexts, regardless of study rigor. Furthermore, studies reported improvements in cognitive engagement, tactical thinking, and decision-making. However, the implementation of questioning faces critical barriers, such as a lack of pedagogical knowledge, time constraints, and the reactive use of the technique. Additionally, the prevalence of descriptive and qualitative designs limits the ability to establish definitive causal relationships. It is concluded that the potential of questioning to foster higher-order learning remains underutilized. It is imperative to develop targeted training programs and conduct rigorous experimental research to evaluate the long-term impact of inquiry strategies on educational and athletic performance, bridging the current gap between theory and professional practice.

Keywords: questioning techniques; physical education, sport coaching; instructional practices, sports

Resumen

El cuestionamiento es una herramienta pedagógica esencial, pero su aplicación práctica en la Educación Física (EF) y el deporte suele ser superficial. Esta revisión de alcance tuvo como objetivo sintetizar la evidencia sobre el uso del cuestionamiento por parte de docentes y entrenadores, examinando patrones, efectos y factores metodológicos. Siguiendo las directrices PRISMA-ScR, se seleccionaron 34 estudios de las bases de datos Scopus, ERIC, Taylor & Francis y MDPI. Se utilizaron las herramientas JBI y MMAT para el mapeo metodológico de los estudios y para mejorar la interpretación de los hallazgos. El análisis reveló un predominio de preguntas de orden cognitivo inferior (conocimiento y comprensión) en ambos contextos, independientemente del rigor de los estudios. Además, los estudios reportaron mejoras en el compromiso cognitivo, el pensamiento táctico y la toma de decisiones. Sin embargo, la implementación del cuestionamiento enfrenta barreras críticas, como la falta de conocimiento pedagógico, las limitaciones de tiempo y el uso reactivo de la técnica. Asimismo, la prevalencia de diseños descriptivos y cualitativos limita la capacidad de establecer relaciones causales definitivas. Se concluye que el potencial del cuestionamiento para fomentar el aprendizaje de orden superior sigue estando infrautilizado. Es imprescindible desarrollar programas de formación específicos y llevar a cabo investigaciones experimentales rigurosas para evaluar el impacto a largo plazo de las estrategias de indagación en el rendimiento educativo y deportivo, reduciendo la brecha actual entre la teoría y la práctica profesional.

Keywords: técnicas de formulación de preguntas; educación física; entrenamiento deportivo; prácticas de enseñanza; deportes



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Introduction

Questioning is a timeless educational tool and has deep roots in ancient Greek philosophy. Socrates and Plato emphasized the importance of questioning as a means of cultivating thought, encouraging reflective processes, and forming logically structured opinions (Nappi, 2017). In modern education, questions serve as stimuli that promote understanding, learning, and the development of critical thinking (Belmekki, 2021; Rahima et al., 2023).

The variety of question types, ranging from closed and open-ended to those requiring recall, comprehension, or creation, allows for the adaptation of teaching to different learning environments (Anderson & Krathwohl, 2001; Milawati et al., 2020). Special emphasis is placed on challenging questions, which require higher cognitive functions, such as analysis, evaluation or synthesis, and are associated with deeper learning and increased student engagement (Belmekki, 2021; Bulent et al., 2016; Chin & Kayalvizhi, 2002).

The contribution of questioning is equally critical in the field of Physical Education (PE) as well as in the broader area of sports. PE, being a subject matter with a strong practical and experiential nature, aims not only at physical development but also at enhancing cognitive, metacognitive, social, and emotional skills (Harvey & Light, 2015; Mosston & Ashworth, 2008). The integration of appropriate questions can support the teaching process by fostering critical thinking and encouraging students' participation through targeted interaction (Ashworth & Chatoupis, 2017). Moreover, questions serve as a tool for developing self-regulation and self-directed learning, both within the context of school PE and in sports environments (Soerel et al., 2023). Additionally, questioning can be used as a guiding strategy that strengthens problem-solving skills and the application of theoretical knowledge to practical situations (Chambers & Vickers, 2006; Thorburn & Seatter, 2015).

Despite these theoretical benefits, and their well-documented value, questions often remain underutilized in movement-based environments (Jones et al., 2023; O'Connor et al., 2021). In addition, existing research in PE and sports appears fragmented and primarily descriptive, often focusing on isolated aspects (e.g., types of questions or specific outcomes) (e.g., Gil-Arias et al., 2015; McNeill et al., 2004; Raya-Castellano et



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al., 2020) without systematically integrating findings across studies. Furthermore, limited attention has been given to how methodological quality influences reported results, making it difficult to interpret the findings of the literature regarding how questioning is used in the context of PE and sport. Therefore, this scoping review aims to synthesize the existing evidence on questioning in PE and sports, identifying patterns across studies, and examining how contextual and methodological factors shape reported outcomes. Specifically, this review addresses the following research questions:

1. What patterns can be identified in the characteristics of questioning used by Physical Education teachers (PETs) and coaches across different contexts?
2. How do the effects of questioning on learners' and athletes' outcomes vary in relation to contextual and methodological factors, including study quality?
3. How does PETs' and coaches' knowledge and training influence the implementation and effectiveness of questioning practices?

Method

This study employed a scoping literature review methodology following the PRISMA-ScR guidelines. Although the review was conducted with rigorous adherence to these standards, a review protocol was not prospectively registered. A comprehensive search was conducted in October 2025, in the Scopus, ERIC, Taylor and Francis, and MDPI databases using the following search string: ("teacher questioning" OR "questioning techniques") AND ("physical education" OR "sports" OR "PE" OR "physical activity" OR "coach"). All retrieved records were imported into Rayyan, a web-based systematic review management tool, where duplicate records were identified and removed prior to screening. Study selection was conducted in two stages: (1) title and abstract screening and (2) full-text eligibility assessment. Two independent reviewers performed the screening process, and any disagreements were resolved through discussion or consultation with a third reviewer when necessary. To refine the selection, the following inclusion and exclusion criteria were applied:

1. Articles were written in English
2. Articles emphasizing the use of questioning in the teaching of PE or in the sports context (by PETs, student PETs, coaches, sport student coaches)



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3. Articles published in peer-reviewed sources (academic journals)
4. Articles with quantitative and qualitative designs

In particular, the records that were removed included:

1. Doctoral thesis and books
2. Articles not written in English
3. Theoretical studies
4. Studies not related to questioning in the teaching of PE
5. Studies not related to questioning in the sports field
6. Studies involving participants with disabilities

Additionally, a manual search of the reference lists of the included articles was performed. This was crucial to ensure that studies focusing on instructional models (e.g., TGfU, Game Sense), where questioning is a key but not always a primary indexed keyword, were not overlooked.

Data extraction was performed independently by two reviewers using a data extraction form. The extracted variables included study characteristics (author, year, country), participant information, study design, context (PE or sport), and key findings related to questioning practices.

All included studies in the final review were assessed for methodological quality by two independent reviewers using established critical appraisal tools. Specifically, four of the Joanna Briggs Institute (JBI) Critical Appraisal Tools were applied to qualitative studies, cross-sectional, quasi-experimental and randomized controlled trials (Barker et al., 2024, Barker et al., 2023; Lockwood et al., 2015, Moola et al., 2017). For mixed-methods studies the Mixed Methods Appraisal Tool (MMAT) was used. For disagreements between the two reviewers, a third-party evaluation was used. Importantly, the methodological quality of the included studies was taken into account during the synthesis and interpretation of the findings.

Results

The search initially yielded 821 records (Scopus: 308, 37.5%; ERIC: 73, 8.9%; Taylor and Francis: 417, 50.8%; MDPI: 23, 2.8%). After removing 20 duplicates (2.4%), 801 records were screened by two of the authors, based on titles and abstracts and



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keywords. There were 11 disagreements between the authors which were resolved through discussion until a consensus was reached. Following this screening, 709 records were excluded. Subsequently, 92 full-text articles were retrieved and assessed independently by the two authors for eligibility, with 70 being excluded for not meeting the inclusion criteria. Ultimately, 22 studies were included in the review. Additionally, 12 more records were identified through manual searching of the reference list. Thus, a total of 34 studies were included in the review. The selection process is summarized in Figure 1 (PRISMA Flowchart), illustrating the progression from the initial identification of records to the final included studies.

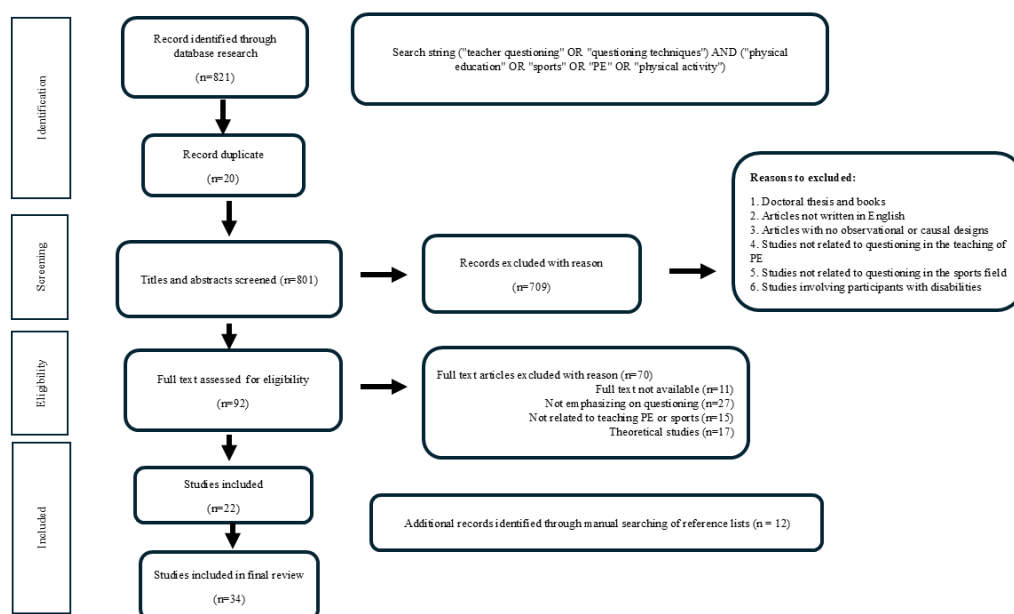


Figure 1. Prisma Flowchart

Overall characteristics and trends

The findings indicate that research on the use of questioning has been conducted across a wide range of countries in both educational ($n = 18$) and sports contexts ($n = 16$). Spain emerges as the most prolific contributor, reflecting a sustained scholarly interest in this domain, followed by the United Kingdom (UK) and the United States of America (USA) (e.g. Gaspar et al., 2021; Roberts, 2011; Zeng et al., 2009). The remaining studies were geographically dispersed across various regions (e.g. Cope et al., 2024; Soerel et al., 2023; Turan et al., 2016). As for the distribution of studies over time, there is a clear upward trend in research activity related to the use of questioning. Approximately one



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quarter of the studies were conducted before 2010, while the remaining three quarters were published after that year, with a particularly notable increase in the last five years.

Also across studies, a clear predominance of qualitative and descriptive designs was observed, including observations, interviews, and questionnaires (e.g., Cope et al., 2016; McNeill et al., 2008). In contrast, relatively few studies employed experimental or quasi-experimental designs (e.g., Chambers & Vickers, 2006; García-González et al., 2013; Gil-Arias et al., 2015).

Findings in PE

Across the 18 PE studies as shown in Table 1, a consistent pattern was the predominance of lower-order cognitive questions (knowledge and comprehension), with higher-order questions (analysis, synthesis, evaluation) used less frequently (Butler, 1997; Donkor et al., 2021a, 2021b; McNeill et al., 2004, 2008; Thorburn & Seatter, 2015). This pattern was observed across different educational levels and participant groups, including PETs and student PETs.

A second key theme concerns the challenges associated with implementing effective questioning. PETs and student PETs frequently reported difficulties in formulating questions aligned with lesson objectives, managing time constraints, and responding to students' answers (Díaz-Cueto et al., 2010; Hover, 2021; Parkes & Hemphill, 2025). Similarly, questioning was often described as easier to apply in situations where errors were clearly identifiable (McNeill et al., 2004).

Third, despite the predominance of lower-order questioning and reported implementation difficulties, questioning was generally associated with positive learner outcomes. Studies reported improvements in students' engagement, motivation, confidence, creativity, and understanding (Askildsen & Løndal, 2024; Gaspar et al., 2021; Hafina et al., 2022; Tekin & Elmas, 2020; Treschman et al., 2025; Zeng et al., 2009).

Finally, intervention studies consistently suggested that targeted training can improve both the quality of questioning and associated learner outcomes (García-Fariña et al., 2022). Improvements included increased use of higher-order questions, greater alignment with learning objectives, and enhanced student engagement and reflective thinking.

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Table 1. The characteristics of the studies in PE field

No.	Study ^{Focus}	Participants	Country	Findings
1.	Butler (1997) ^a	10 PETs (Primary and Secondary Education)	USA	In the TGfU method: -More knowledge-based questions were asked compared to organizational ones. -Questions were directed to groups of children. In the technique-focused method: -Questions were addressed to the entire class. After the intervention, the number of all types of questions increased. Regardless of the method used, a greater number of lower-order cognitive questions (knowledge and comprehension) were employed.
2.	McNeill et al. (2004) ^{a,b,c}	11 student PETs (Primary education)	Singapore	-More questions of low-order. -More experienced student PETs asked more relevant questions. -Questioning that involved the whole class were generally unproductive. -The use of questions enhanced students' confidence and understanding -The student PETs found it easier to ask questions when the mistake was obvious - Student PETs improved questioning skills over time
3.	McNeill et al. (2008) ^a	49 student PETs (Primary and Secondary Education)	Singapore	-More questions of low-order. -The questions did not align with the lesson objectives. -The questions were mainly directed at individuals. -The majority of the questions were asked during practice.
4.	Zeng et al. (2009) ^c	16 PETs (Secondary Education)	USA	-The use of questioning was associated with students' cognitive engagement
5.	Díaz-Cueto et al. (2010) ^b	5 PETs (Secondary Education)	Spain	-They felt anxious and uncertain about using questioning. -They struggled to give students enough time to think. -They did not know how to respond when many students did not answer. -They recognized the importance of questioning but reported difficulty in its implementation.
6.	Thorburn & Seatter (2015) ^{a,b}	2 PETs and their 20 students (Secondary Education)	UK	-Mainly low-order level questions (knowledge) were used. -Divergent questions were primarily asked during practical lessons, while convergent questions dominated theoretical lessons. -More questions were posed during teaching rather than before or after. -Both students and PETs showed a positive attitude toward the use of questions.



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7.	Turan et al. (2016) ^b	65 student PETs	Turkey	-High levels of self-efficacy and question formulation -Positive correlation between self-efficacy and questioning skills
8.	Tekin & Elmas (2020) ^c	77 students (Secondary Education)	Turkey	-The use of questions in teaching improved students' creativity and imagination
9.	Donkor et al. (2021a) ^a	39 student PETs	Ghana	-More lower-order cognitive questions (knowledge, comprehension) - One question per minute
10.	Donkor et al. (2021b) ^a	39 student PETs	Ghana	-Rates as well as proportions of questions: knowledge 37%, comprehension 35%, synthesis 3%, evaluation 25%, application 0%, analysis 0%
11.	Gaspar et al. (2021) ^c	111 students (Primary education)	Spain	-Using questions in teaching enhances motivation and the intention to participate -Improving students' perceptions of their motor skills.
12.	Hover (2021) ^b	4 student PETs	USA	-Difficulty in formulating questions that align with the learning objectives
13.	García-Fariña et al. (2022) ^d	2 PETs (Primary education)	Spain	-The post-program questions became more constructivist, linking information to students' actions and prior knowledge, while reducing reliance on praise.
14.	Hafina et al. (2022) ^c	26 students (Primary education)	Indonesia	-Positive character development, with improvement in tolerance, cooperation, discipline, and honesty
15.	Askildsen & Løndal (2024) ^c	1 PETs and 11 students (Secondary education)	Norway	-The use of questioning developed a more aware, attentive, and meaningful response to movement experiences
16.	Azevedo et al. (2024) ^c	6 student PETs	Portugal	-Improvement of reflection ability
17.	Parkes & Hemphill (2025) ^b	14 student PETs	USA	-Difficulty using open-ended questioning techniques - student PETs reported nervousness, being time-conscious, inexperience at teaching and forgetting as reasons for omitting questions
18.	Treschman et al. (2025) ^c	3 PETs and 33 students (Secondary education)	Australia	- The use of questioning shifted feedback toward self-regulated thinking and gave teachers clearer insight into students' understanding.

^a characteristics of questions posed by teachers, ^b teachers' knowledge and perception regarding the formulation of effective questions, ^c the impact of questioning on learners' needs, ^d impact of an educational program on teachers' quality of questions



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Findings in Sports context

In the context of sports, a total of sixteen ($n = 16$) studies were identified as shown in Table 2. Coaches predominantly used lower-order and convergent questions, while higher-order or divergent questions were less frequent (Cope et al., 2016; O'Connor et al., 2021; Raya-Castellano et al., 2020). Questioning was often applied after activities rather than being fully integrated into the learning process (Light & Robert, 2010).

Coaches consistently reported difficulties in formulating effective questions, managing timing, and integrating questioning into practice sessions (Roberts, 2011; Partington & Cushion, 2013; Kinnerk et al., 2024). Time constraints, lack of training, and limited pedagogical knowledge were identified as key barriers.

Questioning was generally associated with improvements in athletes' tactical understanding, decision-making, and reflective thinking (García-González et al., 2013; Gil-Arias et al., 2015; Práxedes et al., 2016; Kinnerk et al., 2025). The integration of questioning with video feedback appeared particularly effective in promoting higher-order thinking and tactical awareness.

Training interventions for coaches were associated with improvements in questioning practices and athletes' learning (Chambers & Vickers, 2006; Raya-Castellano et al., 2024). In particular, combining questioning with instructional strategies such as video feedback enhanced its effectiveness.



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Table 2. The characteristics of the studies in sports field

No.	Study ^{Focus}	Participants	Sports Type	Country	Findings
1.	Chambers & Vickers (2006) ^{c,d}	24 swimmers	Individual	Canada	-Coach training positively impacted athletes' technique early in the training period (6 weeks), enhancing their ability to solve technical problems, although it did not lead to immediate performance improvements. -Performance improvements were observed in the long term (10 weeks).
2.	Light & Robert (2010) ^{a,c}	4 rugby coaches	Team	Australia	-Questions are usually asked after the completion of the exercise or game, rather than as an integral part of the learning process. -Questioning enhances understanding and provides opportunities for discussion.
3.	Broek et al. (2011) ^c	122 Post graduated student PETs	Team	Belgium	- Questioning is less effective in competitive sports compared to direct coaching. -Improvement in levels of tactical awareness in volleyball regardless of group -Greater improvement was observed in students who were exposed to tactical questioning. -Males showed a greater increase in tactical awareness levels in the retention test compared to female
4.	Roberts (2011) ^b	5 male cricket coaches	Team	UK	-They considered questioning important but difficult, requiring experience and deep game knowledge. -Difficulty in implementation due to insecurity, poorly phrased questions, and lack of training.
5.	García-González et al. (2013) ^c	11 tennis players (n=6 control group, n=5 experimental group)	Individual	Spain	-The use of video feedback combined with questioning led to an improvement in tactical knowledge. -It had a positive effect on decision-making ability during the game.
6.	Partington & Cushion (2013) ^b	11 football coaches	Team	UK	- Difficulty formulating questions that align with the learning objectives
7.	Gil-Arias et al. (2015) ^c	8 volleyball players (n=4 control group, n=4)	Team	Spain	-The use of video feedback combined with questioning resulted in more complex, advanced, and organized tactical knowledge. -It positively influenced decision-making ability during the game.

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8.	Cope et al. (2016) ^a	experimental group) 5 football coaches	Team	UK	-A total of 248 questions were recorded. -Coaches did not allow players sufficient time to reflect on their answers. -Guiding questions were used when no response was given or when the response was not desired, often involving low-order demand. -A higher proportion of closed-ended questions were utilized. -The use of questioning enhanced the athletes' decision-making ability.
9.	Práxedes et al. (2016) ^c	18 football players	Team	Spain	-The use of questions during video feedback led to improved engagement. -Questioning was the least frequent behavior observed. -Coaches tended to use more convergent questions than divergent ones.
10.	Raya-Castellano et al. (2020) ^{a,c}	4 football coaches	Team	USA	-The use of questions during video feedback led to improved engagement. -Questioning was the least frequent behavior observed. -Coaches tended to use more convergent questions than divergent ones.
11.	O'Connor et al. (2021) ^a	19 football coaches	Team	UK	-A total of 2,495 questions were recorded across 35 observed lessons. -Slightly more convergent/closed questions were posed. -Divergent/open questions were mainly observed during the teaching of tactical elements. -Nearly half of the questions were of low-order demand.
12.	Soerel et al. (2023) ^a	6 dance teachers	Individual	Netherlands	-Use of closed questions in traditional dance lessons -Use of open questions in improvisation classes
13.	Cope et al. (2024) ^b	13 coaches	-	Saudi Arabia	Recognition of the value of questions
14.	Raya-Castellano et al. (2024) ^d	6 football coaches	Team	Spain	-All coaches developed their understanding of the appropriate moments to use convergent and divergent questions. -Increase in convergent questions during training sessions. -Increase in divergent questions both between training drills and when the coach paused the game.
15.	Kinnerk et al. (2024) ^b	12 Gaelic football coaches	Team	Ireland	-They possessed knowledge regarding the use of questioning -Difficulty in implementation due to time constraints and lack of training -Integration questioning with video analysis as more effective
16.	Kinnerk et al. (2025) ^c	12 Gaelic football coaches and 76 athletes	Team	Ireland	-The use of questioning encourages athletes to reflect, think critically and solve problems -Players suggested their improved performance was mainly due to questioning

^a characteristics of questions, ^b coaches' knowledge and perceptions regarding the use of questioning, ^c impact of questioning on athletes, ^d effectiveness of coach training programs on the use of questioning.



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Risk of bias assessment

As shown in Table 3, among the 18 PE studies, 11 were rated as low risk of bias, primarily due to clear procedures, ethical compliance, and rigorous data analysis. Three studies were assessed as moderate risk, mainly because of small sample sizes or methodological limitations, three as moderate-to-high risk owing to limited transparency and insufficient critical reflection, and one study (Hafina et al., 2022) as high risk, primarily due to poor sample representativeness and weak data integration. Similarly, among the 16 sport studies, 12 were rated low risk and 3 moderate risk, while only one study (Chambers & Vickers, 2006) was considered high risk due to participant attrition and insufficient statistical control. No study was excluded based on risk of bias instead, the assessment informed interpretation of the findings.



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Table 3. Risk of bias tools

	Study Type	Risk of Bias Tool	Overall Risk of Bias
Physical Education			
Butler (1997)	Quasi-experimental	JBİ	Moderate-high
McNeill et al. (2004)	Qualitative	JBİ	Low
McNeill et al. (2008)	Cross Sectional	JBİ	Low
Zeng et al. (2009)	Cross Sectional	JBİ	Low
Díaz-Cueto et al. (2010)	Qualitative	JBİ	Low
Thorburn & Seatter (2015)	Mixed method	MMAT	Moderate
Turan et al. (2016)	Cross Sectional	JBİ	Low
Tekin & Elmas (2020)	Quasi-experimental	JBİ	Moderate
Donkor et al. (2021a)	Case study	JBİ	Moderate-high
Donkor et al. (2021b)	Case study	JBİ	Moderate-high
Gaspar et al. (2021)	Quasi-experimental	JBİ	Low
Hover (2021)	Qualitative	JBİ	Low
García-Fariña et al. (2022)	Mixed method	MMAT	Moderate
Hafina et al. (2022)	Mixed method	MMAT	High
Askildsen & Løndal (2024)	Qualitative	JBİ	Low
Azevedo et al. (2024)	Qualitative	JBİ	Low
Parkes & Hemphill (2025)	Qualitative	JBİ	Low
Treschman et al. (2025)	Qualitative	JBİ	Low
Sports			
Chambers & Vickers (2006)	Experimental	JBİ	High
Light & Robert (2010)	Qualitative	JBİ	Low
Broek et al. (2011)	Experimental	JBİ	Moderate
Roberts (2011)	Qualitative	JBİ	Low
García-González et al. (2013)	Quasi-experimental	JBİ	Low
Partington & Cushion (2013)	Mixed method	MMAT	Moderate
Gil-Arias et al. (2015)	Quasi-experimental	JBİ	Low
Cope et al. (2016)	Qualitative	JBİ	Low
Raya-Castellano et al. (2020)	Mixed method	MMAT	Moderate
O'Connor et al. (2021)	Cross Sectional	JBİ	Low
Práxedes et al. (2016)	Quasi-experimental	JBİ	Low
Soerel et al. (2023)	Cross Sectional	JBİ	Low
Cope et al. (2024)	Qualitative	JBİ	Low
Raya-Castellano et al. (2024)	Mixed method	MMAT	Low
Kinnerk et al. (2024)	Qualitative	JBİ	Low
Kinnerk et al. (2025)	Mixed method	MMAT	Low

Discussion

The present scoping review aimed to critically synthesize the literature on the use of questioning in PE and sport. The number of PE studies was slightly higher, reflecting a longstanding research tradition in educational contexts, particularly within European regions where game-based pedagogical approaches and instructional strategies emphasizing questioning have historically been developed. This emphasis aligns with key educational goals in PE, as questioning techniques are closely linked to enhancing

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students' cognitive engagement, reflective thinking, motivation, and overall physical literacy (Mandigo et al., 2019). However, the predominance of descriptive and qualitative designs in the literature indicates that current research is more suited to describing how teachers and coaches use questioning rather than establishing causal relationships regarding its effectiveness. For example, while studies such as McNeill et al. (2008) and Cope et al. (2016) provide detailed descriptions of questioning patterns and perceived outcomes, only a few quasi-experimental studies (e.g., Chambers & Vickers, 2006; García-González et al., 2013) attempt to measure the direct impact of questioning interventions on learner or athlete outcomes. This methodological profile partly explains the variability and inconsistency observed across findings.

Physical Education

Across the 18 PE studies, a consistent pattern emerged showing the predominance of lower-order questions. This finding is reinforced by the fact that it remains consistent regardless of the methodological quality of the studies. Specifically, both high-quality studies with low risk of bias (e.g., McNeill et al., 2004, 2008) and those with moderate methodological limitations (Butler, 1997; Donkor et al., 2021a; Thorburn & Seatter, 2015) consistently report a greater use of knowledge and comprehension questions. While some variability exists due to contextual factors or different pedagogical models (Pill et al., 2024), the systematic reliance on surface-level questioning appears to be a robust trend across different educational levels. From a pedagogical perspective, this predominance is concerning, as it confirms that the potential of questioning to foster higher-order learning and critical thinking remains broadly underutilized in practice.

This underutilization is closely linked to the challenges PETs and student PETs face in effectively implementing questioning strategies, which include aligning questions with lesson objectives, managing time constraints, and responding appropriately to students' answers (Díaz-Cueto et al., 2010; Hover, 2021; Parkes & Hemphill, 2025). Furthermore, questioning was reported as being easier to implement only in situations where student errors were obvious (McNeill et al., 2004), suggesting a reactive rather than a strategic use of the technique. Research highlights that questioning in PE is not merely a pedagogical technique but a complex instructional skill requiring both



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experience and pedagogical content knowledge. Importantly, many of these findings come from qualitative studies with low risk of bias, which strengthens the reliability.

Despite the predominance of lower-order questioning and the implementation challenges, questioning was generally associated with potential positive outcomes for learners, such as perceived improvements in students' engagement, motivation, confidence, creativity, and understanding. However, the interpretation of these results should be undertaken with caution, considering both the quality and the nature of the available evidence. On the one hand, these benefits have been consistently reported in several high-quality qualitative studies with a low risk of bias (e.g., Askildsen & Løndal, 2024; McNeill et al., 2004; Treschman et al., 2025), which offer robust and detailed accounts of the observed outcomes. On the other hand, much of the evidence for direct impact comes from quasi-experimental or mixed-method designs where the risk of bias is often moderate to high (e.g., Butler, 1997; Hafina et al., 2022). This makes it harder to prove a definitive cause-and-effect relationship across the board. Therefore, while the current evidence points towards positive outcomes, additional high-quality experimental studies are needed to establish these findings more conclusively.

Given the clear potential of questioning to enhance student learning, attention should be directed towards identifying effective ways of supporting teachers in developing and refining this skill. Targeted educational interventions appear to be a promising way to improve the quality of questioning and learner outcomes. However, it is important to note that only one study in this review specifically evaluated the impact of an educational program on teachers' questioning practices (García-Fariña et al., 2022). This mixed-method study, which was of moderate methodological quality, reported positive changes, such as a shift toward higher-order questions and better alignment with lesson goals. While these findings are encouraging, caution should be exercised when generalizing them, given that they are derived from a single study with certain methodological limitations. This lack of intervention-based research highlights an important gap in the literature. Although educational programs are likely helpful, we need stronger, large-scale studies to confirm that these benefits last over time and work across different PE settings.

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Sports

Similar to the patterns observed in PE, across the 16 sports studies, a consistent pattern emerged where coaches predominantly used lower-order and convergent questions, while higher-order ones remained less frequent (O'Connor et al., 2021; Raya-Castellano et al., 2020). Interestingly, the questioning style seems to shift based on the task, with more open-ended questions occurring during tactical instruction or improvisation (Soerel et al., 2023). However, a significant strategic flaw is the timing: questions are typically reactive, asked after an exercise is completed rather than being integrated into the active learning process (Light & Robert, 2010). Importantly, most of these findings come from high-quality studies with a low risk of bias, which strengthens the reliability of these observed trends. While some moderate-risk evidence exists (e.g., Raya-Castellano et al., 2020), the overall consistency across studies confirms that the potential of questioning in sports remains largely underutilized and inconsistently applied.

This predominance of lower-order questioning is closely linked to the practical challenges coaches encounter in the field. Specifically, coaches consistently reported difficulties in formulating effective questions, managing timing, and integrating questioning into practice sessions (Cope et al., 2016; Roberts, 2011; Partington & Cushion, 2013; Kinnerk et al., 2024). Barriers such as time constraints, a lack of formal training, and limited pedagogical knowledge were frequently cited. These findings, largely derived from high-quality studies with a low risk of bias (e.g., Cope et al., 2016; Kinnerk et al., 2024), mirror the challenges identified in PE contexts. This consistency across both environments suggests that implementation difficulties are not context-specific but rather highlight the inherent complexity of questioning as an instructional skill. While some moderate-risk evidence exists (e.g., Partington & Cushion, 2013), the overall evidence strongly confirms that coaches struggle to move beyond intuitive practice without specialized pedagogical support.

Mirroring the findings in PE, questioning in sports was associated with improved tactical understanding, decision-making, and reflective thinking (e.g. García-González et al., 2013; Gil-Arias et al., 2015; Práxedes et al., 2016; Kinnerk et al., 2025). Specifically, the integration of questioning with video feedback proved effective in fostering advanced

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tactical knowledge and athlete engagement (García-González et al., 2013; Raya-Castellano et al., 2020), while also enhancing opportunities for discussion (Light & Robert, 2010). However, as in PE, the strength of this evidence varies based on methodological quality. While high-quality, low-risk studies confirm cognitive gains (e.g., Gil-Arias et al., 2015; Kinnerk et al., 2025), broader claims such as long-term technical problem-solving or increased tactical awareness, stem from studies with moderate or high risk of bias (Chambers & Vickers, 2006; Broek et al., 2011). Consequently, while the overall trend is positive, caution is warranted regarding the robustness of these outcomes across different competitive levels.

Similarly to the gaps identified in PE, research evaluating coach training interventions remains remarkably scarce and methodologically limited. The current evidence, derived from studies with moderate (Raya-Castellano et al., 2024) to high risk of bias (Chambers & Vickers, 2006), suggests that while structured support can shift coaching behavior toward more strategic questioning, these shifts do not immediately translate into performance gains. This discrepancy highlights a significant disconnect between coach development and athlete outcomes. The reliance on studies with low methodological rigor makes it difficult to draw definitive conclusions, suggesting that without more high-quality, longitudinal research, the true efficacy of coach education in questioning remains speculative rather than evidence-based.

The conceptual framework underpinning the present review positions questioning as a key pedagogical mechanism through which instructional practices influence learning outcomes. Questioning is understood to facilitate the progression from lower- to higher-order thinking (Bloom, 1956), enhance cognitive engagement (Hattie, 2009), support metacognitive regulation (Panadero, 2017), and promote critical reasoning through dialogue and reflection (Paul & Elder, 2007). These assumptions are further aligned with inquiry-based learning and critical pedagogical perspectives, which view questioning not merely as a means of checking understanding but as a catalyst for exploration, knowledge construction, and learner active participation in meaning-making processes (Dewey, 1938; Freire, 1970; Hmelo-Silver et al., 2007; Tinning, 2002). Within these frameworks, higher-order questions are expected to stimulate analysis, evaluation, problem solving,



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and reflective inquiry, whereas lower-order questions primarily support recall and basic comprehension.

Viewed in light of these theoretical perspectives, the findings of the present review suggest that questioning practices across both PE and sport settings remain predominantly oriented toward lower-order cognitive processes. Although such questioning may effectively support foundational learning, its predominance indicates that the broader pedagogical potential of questioning to promote inquiry, dialogue, critical reflection, and higher-order thinking is not being fully realized within current educational and coaching practices.

Practical Implementations

Given the predominance of lower-order questioning identified in the present review, teacher and coach education programmes (both in professional development contexts and initial university studies) should provide structured opportunities to develop higher-order questioning skills through deliberate practice, including micro-teaching, video-based reflection, and guided feedback. At a pedagogical level, teachers and coaches should be encouraged to embed questioning within inquiry- and problem-based learning activities that require learners to analyse game situations, justify decisions, and reflect on their actions. In PE and sport settings, this may involve the use of game-based scenarios, tactical discussions, guided discovery tasks, and structured reflection activities that prompt learners to explain, evaluate, and adapt their decisions. Such approaches may help practitioners move beyond information transmission toward more cognitively engaging learning environments, offering more frequent opportunities.

Limitations

However, this study has several limitations that should be acknowledged. First, only English-language peer-reviewed articles were included, which may have excluded relevant studies in other languages. Additionally, although a comprehensive search strategy was employed across four major databases, the identification of a considerable number of additional studies through manual reference searching suggests a degree of indexing bias. This indicates that research on questioning is often embedded within



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broader pedagogical investigations and may not be consistently captured by database indexing terms.

An additional limitation pertains to the absence of prospective protocol registration. Although the review was conducted according to predefined methodological procedures, including predetermined eligibility criteria, search strategies, screening procedures, and data extraction methods, the protocol was not registered in a publicly accessible repository prior to the commencement of the review. Moreover, transparency is reduced and independent verification of protocol adherence throughout the review process is limited.

Finally, the included studies showed substantial methodological heterogeneity across research designs, samples, data collection, and analytical approaches, limiting direct comparability and the synthesis of a unified pattern of effects. Although critical appraisal tools informed interpretation of study quality, the coexistence of qualitative, quasi-experimental, cross-sectional, and mixed-methods designs introduces variability in the strength and interpretability of evidence. Consequently, findings should be interpreted with caution. In addition, the predominance of small-scale studies reporting mainly positive pedagogical outcomes suggests a potential risk of publication and reporting bias within the field.

Conclusion

This scoping review suggests that questioning serves as a fundamental, yet often underutilized, pedagogical tool in both PE and sport. While there is a broad recognition of its potential to foster cognitive engagement and reflective thinking, its implementation in practice appears to be predominantly superficial. Across both contexts, a consistent trend emerges where instructors (PETs, student PETs and coaches) tend to rely on lower-order, convergent questions, suggesting that the transition from traditional directive instruction to more investigative, higher-order inquiry remains a significant challenge regardless of the setting.

The findings indicate that effective questioning is not merely an instructional technique but a complex skill influenced by pedagogical knowledge, experience, and contextual constraints. Both in PE and in sport contexts instructors seem to face



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comparable barriers, such as perceived time pressure and difficulties in aligning questions with specific learning objectives in real-time. Consequently, questioning often functions reactively to check for immediate comprehension, rather than being strategically integrated to challenge learners' cognitive boundaries and promote deeper tactical problem-solving.

Although the evidence suggests that structured questioning is linked to improvements in tactical understanding and decision-making, these conclusions carry inherent limitations. The predominance of descriptive and qualitative research, alongside a notable proportion of studies with moderate to high risk of bias, makes it difficult to establish clear causal links. Thus, this methodological profile suggests that current findings, while encouraging, should be viewed as preliminary rather than definitive regarding the long-term influence of specific questioning strategies on athletic or educational performance.

Finally, this review identifies a critical research gap concerning the efficacy of targeted educational and training programs. There is currently limited high-quality evidence evaluating how professional development programs translate into sustained improvements in either instructors' behavior or learner outcomes.

From a practical perspective, this suggests the need for more structured and pedagogically grounded training for PETs and coaches, with a focus on developing higher-order questioning skills and supporting their real-time application in practice environments. Future research should prioritize the following:

- conduct rigorous studies to establish clearer causal relationships between higher-order questioning and long-term learning or performance gains
- design and evaluate structured educational and training programs for both PETs and coaches to identify evidence-based models for professional development
- investigate the optimal timing and frequency of questions within active, game-based, and experiential learning environments
- explore how questioning strategies should be adapted across different age groups, skill levels, and diverse sporting disciplines



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- enhance the evidence base by utilizing validated assessment tools and examining how questioning interacts with other pedagogical aids, such as digital technology and video feedback

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