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To cite this article: S. J. Richardson, A. P. McRobert, D. Vinson, C. J. Cronin, C. Lee & S. J. Roberts (13 Oct 2023): Systematic Review of Sport Coaches' and Teachers' Perceptions and Application of Game-Based and Constraints-Led Pedagogy: A Qualitative Meta-Study, *Quest*, DOI: [10.1080/00336297.2023.2257343](https://doi.org/10.1080/00336297.2023.2257343)

To link to this article: <https://doi.org/10.1080/00336297.2023.2257343>



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Published online: 13 Oct 2023.



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Systematic Review of Sport Coaches' and Teachers' Perceptions and Application of Game-Based and Constraints-Led Pedagogy: A Qualitative Meta-Study

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ABSTRACT

This study represents the first comprehensive qualitative systematic review on sport coaches' and teachers' perceptions and application of Game-Based Approaches (GBA) and Constraints-Led Approach (CLA). From searching 12 electronic academic databases from 1982 to 2020, 29 studies met the eligibility criteria and were included in the meta-study. Data revealed studies were conducted in several different countries, and case study design was the predominant methodology. The main data collection method reported was cross-sectional interviews. There were inconsistencies in the quality of reporting methodologies, sampling procedures, data analysis, and assessing quality. The meta-theory analysis identified weaknesses in the methodological and conceptual approaches, and a low number of studies stated philosophical perspectives. The meta-synthesis identified assumptions about learning, pedagogical knowledge and skills, content knowledge, and support as the overarching themes reported to impact coaches' and teachers' perceptions and application of GBAs and CLA. Finally, some recommendations for future research and practice are provided.

KEYWORDS

Game-based approach;
constraints-led approach;
systematic review

Introduction

A Game-Based Approach (GBA) is a collective term for pedagogic approaches reported to enhance learner motivation, skill transfer, decision-making, skill-execution, and game-playing performance (Kinnerk et al., 2018). Associated to social constructivist learning theory (Griffin & Richard, 2023), the pedagogic variations that align to GBAs include Teaching Games for Understanding (TGfU; Bunker & Thorpe, 1982), Tactical Games Model (Mitchell et al., 2006), Play Practice (Lauder, 2001), and Game Sense (Den Duyn, 1996). While the previous GBA reviews (e.g., Harvey & Jarrett, 2014; Kinnerk et al., 2018) stimulated much theoretical and contextual debate, no definitive conclusions surrounding sport practitioners' perceptions and application of GBAs were provided. Unlike the earlier GBA reviews (Harvey & Jarrett, 2014; Kinnerk et al., 2018), this meta-study also extends the scope by including learner-environment approaches evolving from ecological dynamics frameworks (Chow et al., 2016) such as non-linear pedagogy (NLP) and constraints-led approach (CLA).

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While GBAs, NLP, and CLA share *some* pedagogic and learner outcome similarities (i.e., representative learning designs, matching task demand to learner development and environments that guide discovery; Renshaw et al., 2016), they are underpinned by contrasting theoretical perspectives (Renshaw et al., 2016). For instance, GBAs are underpinned by social constructivist learning theory and, it is argued, promote learners' game understanding via the transferability of key tactical elements (Griffin & Richard, 2023). GBAs provide a learner-centered approach with situated modified games and inquiry-based learning central to the pedagogy (González-Víllora et al., 2021). Conversely, NLP and CLA are underpinned by ecological dynamics (Yearby et al., 2022) with NLP being a framework to support sport practitioners with their application of CLA (Chow, 2013). CLA, on the other hand, aims to support sport practitioners' knowledge of how constraints (i.e., individual, environment, and task) (Newell, 1986) can be manipulated to support learners' skill acquisition (Chow, 2013).

By including NLP and CLA in this review, we are not seeing *another* [emphasis added] GBA (Renshaw & Chow, 2019) and, therefore, not attempting to add NLP or CLA to the current myriad of GBAs despite there being some practical similarities. Instead, we support the view of Stolz and Pill (2014, p. 36) in that empirical-scientific testing of competing pedagogies is not conducive for bridging the epistemological gap “between researcher as theory generator and teacher practitioner as theory applier.” For clarity, we are adopting a “both/and” rather than an “either/or” perspective (Rovegno et al., 2001).

Despite the theoretical differences between these pedagogies, previous research evidence suggests that these pedagogies support athlete learning in cognitive, affective, and psychomotor domains (Fitton Davies et al., 2021; Harvey & Jarrett, 2014; Kinnerk et al., 2018; Lee et al., 2014). However, it has also been reported that these pedagogies can be challenging for sport practitioners. For example, questioning, planning, facilitation, understanding of the pedagogy, and a lack of tactical knowledge are some of the challenges teachers/coaches have reported when attempting to implement a GBA (Cushion, 2013; Harvey et al., 2015; Roberts, 2011). Whereas interpretative challenges (i.e., time taken to learn CLA), observation skills, practice design, insufficient understanding of ecological dynamics, and philosophical ambiguity, are some of the difficulties experienced by educators attempting to implement NLP and CLA (Chow, 2013; Moy et al., 2019).

A qualitative meta-study would provide a synthesis of previous methods and theoretical similarities and discrepancies in real-life contexts. This is important, because qualitative research in the form of a meta-synthesis could provide new knowledge about the topic in question with greater influence than a single study (Atkins et al., 2008). The last review by Kinnerk et al. (2018) on GBAs within competitive team sport contexts reported how the pedagogy supported players primarily in the cognitive and affective domains, while coaches were found to experience challenges with their planning and practice design. Building on the last review (Kinnerk et al., 2018), this meta-study is the first to systematically review coaches' and teachers' perceptions and application of GBAs, NLP, and CLA from 1982 to 2020. The aims of this qualitative meta-review are 1) critically assess the methodological and theoretical qualitative research in studies conducted on teachers' and sport coaches' perceptions and application of GBAs, NLP, and CLA from 1982 to 2020, and 2) re-examine previous research findings and identify research gaps.

Method

The PRISMA-P (2015) (Moher et al., 2015, p. 1) is “a 17-item checklist” which includes guidelines on what information (e.g., administrative details, rationale, and methodology) should be included in a systematic review protocol. Aligned with the Moher et al. (2015) checklist (Moher et al., 2015), a draft qualitative systematic review protocol (available upon request) was developed which included administrative details (e.g., author details and contributions), an introduction with the rationale for the review, and a method section outlining the eligibility criteria, search strategy, screening process, and data analysis.

Following consensus of the review protocol among the research team, a systematic search of the following 12 electronic databases was conducted by the lead author: EBSCOhost (SPORTDiscus, Education Research Complete), Web of Science, Scopus, Taylor and Francis, ScienceDirect, Wiley, Emerald, Ingenta Connect, Google Scholar, Sage, ProQuest (PsycINFO), and PubMed Central (PMC), with the following GBA, NLP, and CLA terms searched (i.e., “Game-Based Approaches” OR GBA, “Game-Centred Approaches” OR GCA, “Teaching Games for Understanding” OR TGfU, “Models-based practice” OR MBP, “Tactical Games Model,” “Play Practice,” “Game Sense,” “Ball School,” “Ballschule,” “Tactical Decision Learning Model,” “Integrated Technical-Tactical Model,” “Invasion Games Competence Model,” “Games Concept Approach,” “Tactical games,” “Game Sense pedagogy,” “Digital Video Games,” “Digital Video Games Approach” OR DVG, “Games for Understanding” OR GFU, “Play-Practice-Play” OR “Play Practice Play,” “Inventing Games” OR “Invented Games” OR IG, “Nonlinear Pedagogy,” “Non-linear Pedagogy,” “Nonlinear Pedagogies,” “Non-linear Pedagogies,” “Constraints Led Approach,” “Constraints-Led Approach”). Following all final searches (contact lead author for all final search strategies administered) the identified studies were exported to Endnote® (reference management software).

The SPIDER framework (Cooke et al., 2012) was used to develop the eligibility criteria (see Table 1). The eligibility criteria were piloted before the screening process commenced (Higgins et al., 2020). Title, abstract, and keyword screening was conducted by two members of the research team on a random sample of 30 studies. Following consensus, the remainder of the papers were screened by the first author. A Microsoft Excel® database was used to record the number of studies excluded and an explanation to why they were excluded. This was achieved by administering a numerical scoring system (i.e., 1–5), whereby each number corresponded to one of the five components of the eligibility criteria (e.g., 1 corresponded with sample). To ensure consistency, the same method was applied across the entire screening process, and studies were only excluded when consensus was reached. The final full-text screening process was completed by two members of the research team.

Table 1. Eligibility criteria.

SPIDER framework	Inclusion criteria
(1) Sample	Sport coaches, educators and teachers.
(2) Phenomena of interest	Perceptions and/or application of GBAs (as stated above. E.g., TGfU, Game Sense), NLP or CLA within a PE or sports context. <i>Hybrid model studies (e.g., TGfU and Sport Education) were excluded.</i>
(3) Design	Qualitative methodologies and methods. <i>Systematic observations, mixed-methods, two-stage approach, fictional narratives (only) and auto-ethnographic were all excluded.</i>
(4) Evaluation	Analysed the phenomena of interest under investigation.
(5) Research type	Empirical studies published between 1982–2020 from peer reviewed journals, English written, abstract and full-text available.

Data analysis

Data abstraction and analysis was performed using Barnett-Page and Thomas (2009) recommendations. Studies were initially read and re-read, so full immersion could be achieved. The methodology, findings/results, discussion, and conclusion were then re-read, and key text and verbatim quotes were highlighted. A Microsoft Excel® spreadsheet was used to record and manage the data abstracted from the studies. Notes and summaries were also recorded for each study. The data abstraction process consisted of the subheadings from findings/results sections and key quotations from the participants. Notes and summaries of data captured under each of the subheadings/themes within the findings/results sections of all studies were then inputted into the spreadsheet to support the data analysis process.

Inductive data analysis and meta-synthesis commenced following data abstraction. First cycle affective coding of findings, personal notes, and summaries were performed, and subjective labels of participant values, attitudes, and beliefs were recorded. Fifteen primary categories were established following this process, and data from all studies were incorporated into a separate spreadsheet. The data were then re-coded and discussions with the research team led to four primary themes being established. A concept map (see [Figure 2](#)) was also produced using MindView 7.0© to illustrate the four primary and fifteen subthemes.

Results and discussion

The initial electronic search captured 28,307 documents, while additional 132 documents were identified from e-mail search alerts. Overall, 10,352 documents were removed (i.e., duplicates), leaving 18,087 documents to screen. Following initial abstract and title screening, 17,435 documents were removed. A total of 652 published studies proceeded to the stage two screening process where further 601 papers were removed. Fifty-one papers proceeded to the final stage of the screening process. On completion of the stage three screening process, 22 studies were excluded, resulting in 29 GBA and CLA studies accepted for final analysis. The PRISMA flow diagram is depicted in [Figure 1](#).

Quality appraisal

Quality appraisal was completed using the Critical Appraisal Skills Programme tool (CASP, 2018). Although quality appraisal is advocated in meta-studies (Boland et al., 2017; Paterson et al., 2001), we are mindful of Smith and McGannon's (2018) argument that predefined criteria may not always be suitable for judging qualitative research. In view of these concerns, we removed the final CASP question, which required an overall assessment on whether the study should be considered low, medium, or high quality. Decisions surrounding what constitutes quality or how we judge qualitative research are complex, and despite some considerations on the issue, it is a debate that remains unresolved (Sparkes & Smith, 2014). We understand the tension(s) that exist for some, by offering a single assessment of qualitative research and "working with lists" (Sparkes & Smith, 2014, p. 201); however, we feel as though the criteria applied in this study were relevant to the nature of qualitative representation captured in the meta-study.

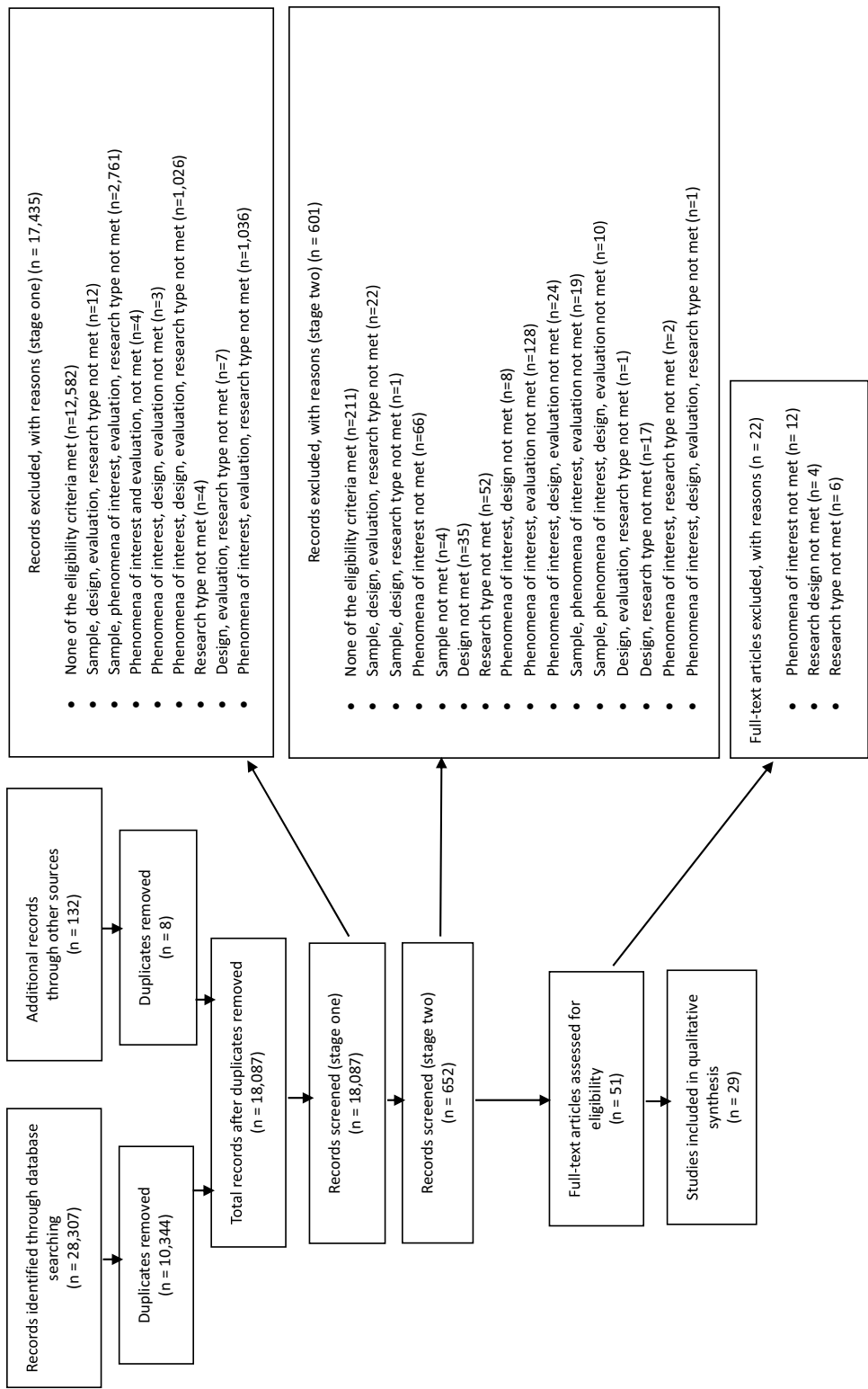


Figure 1. PRISMA flow diagram (Moher et al., 2009).

Findings from the quality appraisal found all 29 studies provided clarity on the aims of the research, and that a qualitative methodology was appropriate for the intended study purpose. All 29 studies captured data that addressed the research aim(s) and provided adequate explanation of their findings. However, eight studies did not provide enough detail on sampling procedures (Brooker et al., 2000; Forrest et al., 2012; Gubacs-Collins, 2007; Harvey et al., 2010, 2015; O'Leary, 2014, 2016; Rossi et al., 2007), or whether their research design was suitable for addressing the purpose of their research (Brooker et al., 2000; Cruz et al., 2012; Dania & Zounhia, 2017; Díaz-Cueto et al., 2010; Harvey et al., 2015; Light, 2004; McNeill et al., 2004; Wang & Ha, 2009).

Furthermore, the rigor of the data analysis was unclear in nine studies (Brooker et al., 2000; Cruz et al., 2012; Dania & Zounhia, 2017; Evans, 2006; Forrest et al., 2012; Light, 2004; McNeill et al., 2004; Pill, 2015; Rossi et al., 2007), while 26 studies (Brooker et al., 2000; Cruz et al., 2012; Dania & Zounhia, 2017; Díaz-Cueto et al., 2010; Evans, 2006, 2012; Forrest et al., 2012; Gubacs-Collins, 2007; Harvey et al., 2015; Jarrett & Light, 2019; Light & Evans, 2010; McNeill et al., 2004; Moy et al., 2019; O'Leary, 2014, 2016; Pill, 2015, 2016; Reid & Harvey, 2014; Roberts, 2011; Rossi et al., 2007; Thomas et al., 2013; Wang, 2013; Wang & Ha, 2009, 2012a, 2012b, 2013) did not clarify the researcher-participant relationship. Lastly, in 13 studies (Cruz et al., 2012; Dania & Zounhia, 2017; Evans, 2006, 2012; Forrest et al., 2012; Gubacs-Collins, 2007; Harvey et al., 2015; Jarrett & Light, 2019; Light & Evans, 2010; Moy et al., 2016, 2019; Reid & Harvey, 2014; Rossi et al., 2007) it was unclear whether ethical considerations had been addressed.

Given these findings, readers may wish to consider some of the research evidence provided in this review with caution, particularly the studies that were judged to be of low quality (e.g., Brooker et al., 2000; Cruz et al., 2012).

Meta-method analysis

Across the 29 studies, four used longitudinal research designs of 12 months or more. Studies were, however, typically short in duration (i.e., 1–4 months). The duration of 16 studies was not stated. The most common research design was case study ($n = 10$); however, many of the studies ($n = 14$) did not state the methodology. Furthermore, 22 studies did not state the author(s) philosophical position or epistemological assumption(s), thus making it difficult, if not impossible, to determine the author(s) perception of social science and how this influenced their research design. The seven studies which included this information adopted a “subjective idealist” approach (Barnett-Page & Thomas, 2009) stating either interpretivism ($n=6$) or constructivism ($n=1$).

Research of GBA clearly holds international appeal as studies were conducted in globally diverse settings (e.g., Australia ($n=7$), United Kingdom ($n=6$), Hong Kong ($n = 5$)), while both CLA studies were conducted in Australia. Typically, studies were conducted in a high school and/or university settings with fewer studies conducted in a primary/elementary school environment. There was a noticeable absence of studies conducted among community sport coaches on their perception and application of NLP and CLA. The most reported GBA was TGfU ($n = 12$) followed by Game Sense ($n = 8$), while invasion games (e.g., soccer) were the most frequent game category. Eleven studies did not make clear which sport/game category was under investigation. There was a shortage of studies on striking/fielding games (e.g., cricket), while sport coaches'

perceptions and application of target games (e.g., golf) have yet to be explored. Given this, future GBA and CLA research should consider examining these under-researched areas.

Thirteen studies did not say what informed their sampling strategy and in one study (McNeill et al., 2004) it was ambiguous. The most common sampling strategy was purposeful ($n = 13$). Meanwhile, facets of purposeful sampling such as criterion-based (Jarrett & Light, 2019) and convenience (Reid & Harvey, 2014) were also used. Although qualitative research cannot make statistical claims of generalization across different populations, notions of transferability across information-rich settings is considered important (Guba & Lincoln, 1989). This is something future studies should aim to address, as not clarifying the sampling technique administered may result in the rigor of the methodology being questioned.

The majority of the GBA studies ($n = 20$) included educators (e.g., primary/elementary and secondary/high school and university tutors) as research participants. Nine studies included sport coaches as participants. Seven GBA studies included male educators with only two GBA studies (Brooker et al., 2000; Dania & Zounhia, 2017) including only female practitioners. Ten GBA studies included both male and female educators. Eight of the GBA studies did not state the gender of the practitioners. The two CLA studies included a sample of male and female PETE students (i.e., trainee PE teachers).

Most studies ($n = 20$) (e.g., Cruz et al., 2012) administered more than one data collection technique; however, nine studies (e.g., Evans, 2006) used a single method (i.e., interviews) to obtain data. Individual or group interviews ($n = 27$), reflective journals/reflections ($n = 13$), observations ($n = 10$), video/audio recordings ($n = 6$), and lesson/session plans ($n = 5$) were the preferred data capture methods. Future studies should consider using multi-methods so methodological triangulation can be conducted, thus supporting the rigor of the findings. In addition, alternative methods such as photo elicitation, visual images, and video recording software (e.g., GoPro©) combined with established qualitative methods should be considered in future studies, as this may provide some additional insight on sport practitioners' perceptions and application of GBAs, NLP, and CLA.

Modes of data analysis included constant comparison ($n = 11$) (e.g., Evans, 2006) and content analysis ($n = 6$) (e.g., Wang, 2013). Grounded theory (e.g., Harvey et al., 2010; Moy et al., 2016) and thematic analysis (Dania & Zounhia, 2017; Moy et al., 2019) was each administered in two studies, while an inductive analysis was administered in three studies (O'Leary, 2014, 2016; Thomas et al., 2013). Other deductive analytical approaches included Lemke's theory of Semiotics (Forrest et al., 2012) and phenomenographic research analysis (Jarrett & Light, 2019). In three of the studies the data analysis was either unclear (Rossi et al., 2007) or not reported (Brooker et al., 2000; Pill, 2015).

Terms such as reliability and validity are generally not considered relevant for assessing qualitative research (Sparkes & Smith, 2014). Most studies ($n = 20$) appeared to be assessing the *credibility* of their research (Guba & Lincoln, 1994) as techniques were administered (e.g., *member checking*, *triangulation*, and *respondent validation*); however, nine of the studies did not state how they addressed levels of trustworthiness. Irrespective of the researcher's stance on "truth claims" (i.e., realism or relativism), it is recommended that greater clarity is provided on how divergent concepts (e.g., rigor and trustworthiness) are represented in future research.

Meta-theory

From a theoretical perspective, constructivist learning theory ($n = 4$), grounded theory ($n = 2$), situated learning theory ($n = 2$), occupational socialization ($n = 2$), and Windschitl (2002) model of constructivist dilemmas in practice ($n = 2$) were used. Ethnomethodology, theory of planned behavior, governmentality, and regulative discourse were all included in one study. Thirteen studies did not report a theoretical perspective, which when coupled with the absence of significant methodological information make it difficult, if not impossible, to determine from a quality perspective whether the research design was appropriate for addressing the intended purpose of the study. Table 2 depicts a summary of findings from the meta-method analysis.

Meta-synthesis

The second aim of this review was to re-examine previous research findings and identify future research gaps. Figure 2 is a concept map which was developed to display the overarching themes and sub-themes developed from the qualitative analysis. Some themes (e.g., support) were more predominant than others (e.g., content knowledge) due to the research evidence, while many themes and sub-themes are associated.

Concept 1: Assumptions about learning

The evidence suggested sport practitioners' assumptions about learning influenced their perception and application of GBAs. Some practitioners were more receptive or open to trying a GBA (Pill, 2015), while others were more ambivalent to how students/players learn and were, therefore, more skeptical (Evans, 2006; Rossi et al., 2007). The evidence also suggested that, over time, teachers/coaches became more receptive to GBAs and CLA (Gubacs-Collins, 2007; Harvey et al., 2010; Moy et al., 2016) and were, more inclined to apply the pedagogies in their practice, perhaps suggesting a change to their assumptions about learning.

Experiences of sport and PE were another finding that influenced coaches' and teachers' assumptions of learning, and consequently their perception and application of GBAs and CLA (Evans, 2012; Moy et al., 2016; O'Leary, 2014). Evidence from GBA studies suggested coaches/teachers assumed views of stakeholders' (i.e., students/players and parents) perceptions of GBAs may influence their opinion of the pedagogy, since it may not appeal with what players and parents regard as effective coaching (Light, 2004; Roberts, 2011) or what students considered PE to be about (Harvey et al., 2015; McNeill et al., 2004) (i.e., playing games but not necessarily to learn).

More research on exploring sport practitioners' assumptions about player/student learning and the influence other stakeholders (e.g., parents) have on coaches' and teachers' views of GBAs and CLA would be a welcome addition to the literature. Further evidence exploring these matters and approaches could help us better support sport practitioners with these pedagogies.

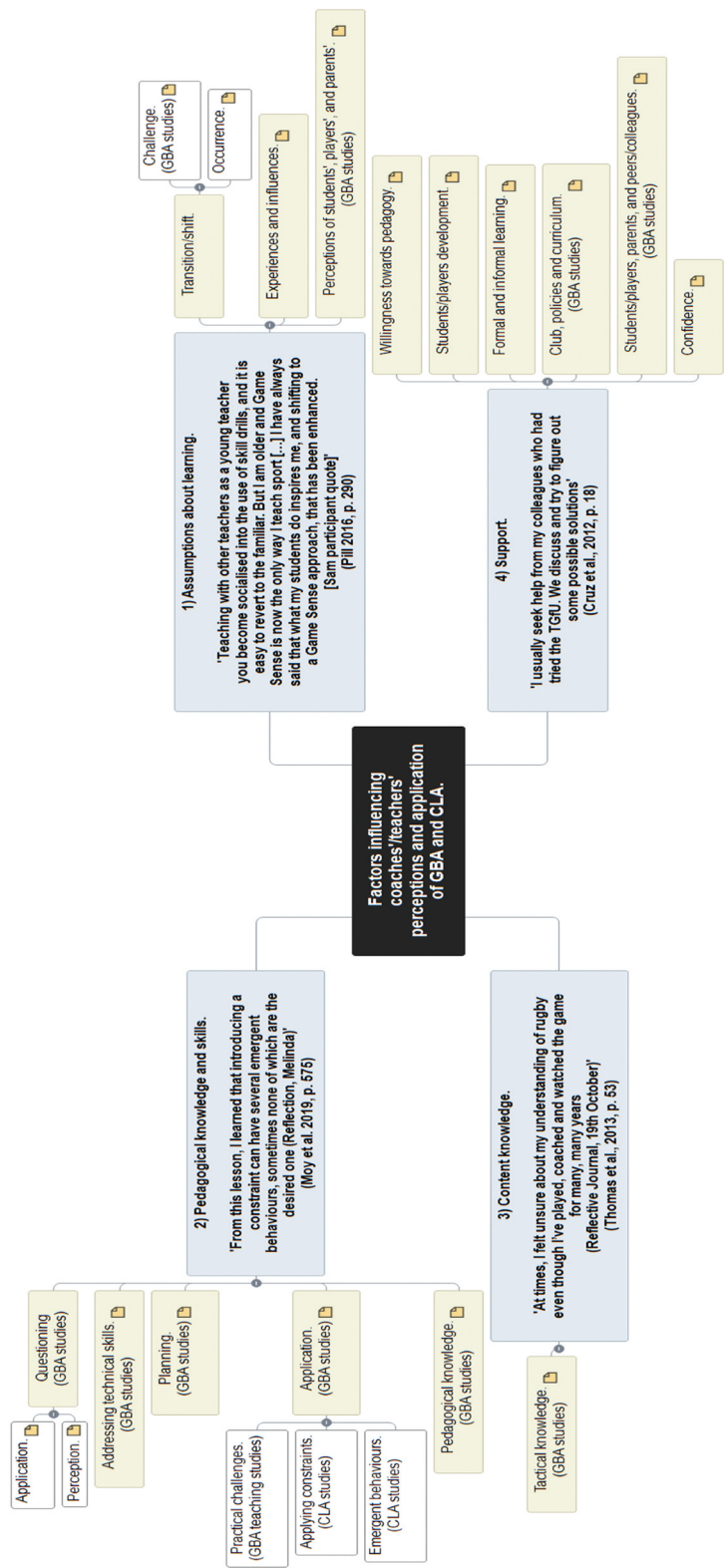


Figure 2. Factors influencing coaches'/teachers' perceptions and application of GBA and CLA.



Table 2. Meta-method analysis.

Study	Purpose	Setting	Philosophical position	Theoretical position	Methodology	Sample	Sampling Strategy	Data collection	Data analysis	Credibility	Journal
Brooker et al. (2000)	PE Teacher's application of Game Sense.	Australia	Not stated	Not stated	Case study	A qualified female high school teacher.	Not stated	5 lessons recorded. Interviews. Reflections.	Not stated	Not stated	European Physical Education Review
Cruz et al. (2012)	Teachers' perceptions and application of TGfU.	Hong Kong	Not stated	Not stated	Not stated	23 trainee secondary school teachers. Genders not stated.	Purposeful	Recorded lessons. Field notes. Interviews. Lesson plans. Reflections.	Inductive analysis and constant comparison	Stated	Asian Journal of Physical Education and Recreation
Dania and Zounhia (2017)	Teachers' perceptions of a TGfU professional development program.	Greece	Not stated	Not stated	Not stated	3 qualified female primary PE teachers.	Not stated	TGfU lesson videos. Reflective journal. Lesson plans. Observations.	Thematic analysis	Stated	International Journal of Sport and Society
Díaz-Cueto et al. (2010)	PE teachers' perceptions and application of TGfU.	Spain	Not stated	Constructivist	Not stated	5 qualified PE teachers. 3 males, 2 females.	Not stated	Interviews. Work group. Diaries. Video recordings.	Constant comparison	Stated	Journal of Teaching in Physical Education
Evans (2006)	Rugby coaches' perceptions and application of Game Sense.	Australia	Interpretative	Not stated	Case study	4 male professional rugby coaches.	Purposeful	Interviews.	Constant comparison	Not stated	Asian Journal of Exercise and Sports Science
Evans (2012)	Rugby coaches' perceptions and application of Game Sense.	New Zealand	Not stated	Not stated	Case study	4 male professional rugby coaches.	Purposeful	Interviews. Observations.	Content analysis	Not stated	Asian Journal of Exercise and Sports Science

(Continued)

Table 2. (Continued).

Study	Purpose	Setting	Philosophical position	Theoretical position	Methodology	Sample	Sampling Strategy	Data collection	Data analysis	Credibility	Journal
Forrest et al. (2012)	PETE students' perceptions and application of GCA.	Australia	Not stated	Ethnomethodology	Not stated	First author and roughly 60 PETE students. Genders not stated.	Not stated	Audio recordings. Observation.	Lemke's theory of social semiotics	Not stated	Physical Education and Sport Pedagogy
Gubacs-Collins (2007)	Tutor and PETE students' perceptions of Tactical Games.	Not stated	Not stated	Not stated	Action research	Tutor's gender not stated. 18 PETE students. 10 females and 8 males.	Not stated	Self-reflections. Video recordings. Interviews.	Inductive method and constant comparison	Stated	Physical Education and Sport Pedagogy
Harvey et al. (2015)	PGCE students' experience with GBAs.	UK	Not stated	Windschitl's (2002) framework	Not stated	19 PGCE students 6 males and 13 females.	Not stated	Discussion board. Reflections. Focus groups.	Constant comparison	Stated	European Physical Education Review
Harvey et al. (2010)	Two soccer coaches' perceptions and application of TGfU.	America	Not stated	Grounded theory	Case study	Two male soccer coaches.	Not stated	Observations. Field notes. Interviews.	Grounded theory	Stated	Physical Education and Sport Pedagogy
Jarrett and Light (2019)	Qualified PE teachers' perceptions of using a GBA.	UK and Australia	Not stated	Variation theory	Phenomenography	12 high school PE teachers. 6 UK 6 Australia. Genders not stated.	Criterion-based	Interviews.	Phenomenographic analysis	Stated	European Physical Education Review
Light (2004)	Coaches' perceptions and application of Game Sense.	Australia	Not stated	Not stated	Not stated	6 coaches. 3 males and 2 females. Not all genders stated.	Purposeful	Interviews	Constant comparison	Not stated	Physical Education and Sport Pedagogy

(Continued)

Table 2. (Continued).

Study	Purpose	Setting	Philosophical position	Theoretical position	Methodology	Sample	Sampling Strategy	Data collection	Data analysis	Credibility	Journal
Light and Evans (2010)	Rugby coaches' perceptions and application of Game Sense.	Australia	Interpretative	Not stated	Case study	4 male rugby coaches.	Purposeful	Interviews. Observations.	Constant comparison	Not stated	Physical Education and Sport Pedagogy
McNeill et al. (2004)	Teachers' application of Games Concept Approach.	Singapore	Not stated	Situated learning theory	Not stated	11 trainee primary PE teachers. 4 males, 7 females.	Unclear	Conversations. Observations. Interviews. Reflections.	Constant comparison	Stated	Sport, Education and Society
Moy et al. (2016)	PETE students' perceptions of CLA.	Australia	Not stated	Grounded theory	Case study	10 PETE students. 6 females, 4 males.	Purposeful	Interviews. Reflections.	Grounded theory	Stated	Physical Education and Sport Pedagogy
Moy et al. (2019)	PETE students' perceptions and application of CLA.	Australia	Not stated	Not stated	Case study	2 PETE students. 1 male, 1 female.	Purposeful	Interviews. Reflections. Observations.	Thematic analysis	Stated	Physical Education and Sport Pedagogy
O'Leary (2014)	Teacher's application of Tgfl.	UK	Not stated	Occupational socialisation	Case study	1 recently qualified male high school PE teacher.	Not stated	Interviews. Observations. Reflections. Lesson plans.	Inductive approach	Stated	European Physical Education Review
O'Leary (2016)	Teacher's application of Tgfl.	UK	Not stated	Occupational socialisation	Case study	1 qualified male high school PE teacher.	Not stated	Interviews. Observations. Reflections. Lesson plans.	Inductive approach	Stated	European Physical Education Review
Pill (2015)	Coaches' perceptions of Game Sense.	Australia	Interpretivist	Not stated	Appreciative Inquiry	2 coaches. Genders not stated.	Purposeful	Interviews.	Not stated	Stated	Sport, Education and Society

(Continued)

Table 2. (Continued).

Study	Purpose	Setting	Philosophical position	Theoretical position	Methodology	Sample	Sampling Strategy	Data collection	Data analysis	Credibility	Journal
Pill (2016)	Teachers' perceptions and application of Game Sense.	Australia	Interpretivist	Not stated	Appreciative Inquiry	3 qualified teachers. 2 secondary 1 primary. Genders not stated.	Purposeful	Interviews	Constant comparison	Stated	Sport, Education and Society
Reid and Harvey (2014)	Coaches' and educators' experiences of Game Sense.	UK	Not stated	Constructivism	Not stated	Unclear.	Convenience	Questionnaire. Interviews. Field notes. Observations.	Constant comparison	Not stated	Sports Coaching Review
Roberts (2011)	Coaches' experiences of using TGfU.	UK	Constructivist	Windschitl's (2002) framework	Case study	5 male ECB cricket coaches.	Purposeful	Interviews. Session plans. Reflections	Constant comparison	Not stated	Physical Education and Sport Pedagogy
Rossi et al. (2007)	Teachers' perceptions of Games Concept Approach.	Singapore	Interpretivist	Governmentality and regulative discourses	Narrative	22 teachers. Genders not stated.	Not stated	Interviews.	Unclear	Stated	Sport, Education and Society
Thomas et al. (2013)	A coach's perceptions and application of TGA.	UK	Interpretivist	Not stated	Not stated	1 coach. Gender not stated. Between 15–22 male students.	Not stated	Interviews. Reflections.	Inductive analysis	Not stated	Sports Coaching Review
Wang and Ha (2009)	Teachers' perceptions of TGfU.	Hong Kong	Not stated	Constructivism	Not stated	20 trainee teachers. 12 males, 8 females.	Purposeful	Interviews.	Content analysis.	Stated	European Physical Education Review
Wang (2013)	Teachers' perceptions of TGfU.	China	Not stated	Theory of Planned Behaviour	Not stated	20 teachers. 9 primary 11 secondary 15 males, 5 females.	Purposeful	Questionnaire. Interviews.	Content analysis.	Stated	Teaching in Physical Education Journal

(Continued)

Table 2. (Continued).

Study	Purpose	Setting	Philosophical position	Theoretical position	Methodology	Sample	Sampling Strategy	Data collection	Data analysis	Credibility	Journal
Wang and Ha (2012b)	Teachers' perceptions of a TGfU mentoring program.	Hong Kong	Not stated	Situated learning theory	Not stated	22 educators, 15 males, 7 females.	Not stated	Interviews. Reflections.	Content analysis.	Stated	European Physical Education Review
Wang and Ha (2012a)	Teachers' perceptions of TGfU.	Hong Kong	Not stated	Constructivist	Not stated	20 pre-service teachers, 12 males, 8 females.	Purposeful	Interviews.	Content analysis.	Stated	Sport, Education and Society
Wang and Ha (2013)	Teachers' perceptions of TGfU.	Hong Kong	Not stated	Not stated	Not stated	22 teachers, 18 males, and 7 females.	Not stated	Interviews.	Content analysis.	Stated	Physical Education and Sport Pedagogy

Concept 2: Pedagogical knowledge and skills

Although the research evidence indicated coaches had *some* understanding of Game Sense and TGfU (Evans, 2012; Harvey et al., 2010), insufficient knowledge of GBAs was also apparent (Harvey et al., 2010; Roberts, 2011). The findings also suggested that coach education tutors lacked clarity on Game Sense and TGfU (Reid & Harvey, 2014; Roberts, 2011) and this led to some coaches forming misconceived perceptions of the pedagogy (Reid & Harvey, 2014). Teachers' insufficient understanding of GBAs (Brooker et al., 2000; Wang & Ha, 2009) was also identified, suggesting educators require support with their conceptual understanding of GBAs.

There was mixed evidence on coaches'/teachers' planning of GBAs, as only Harvey et al. (2010) acknowledged the contrast in planning between two soccer coaches. Cruz et al. (2012) found teachers thoroughly planned their TGfU lessons utilizing the resources (e.g., websites and books) and gaining advice from their colleagues or supervisor, while Brooker et al. (2000) alluded to the teacher having a fixed approach to her lesson plans, thus hindering her application of Game Sense. For some teachers, the planning process (McNeill et al., 2004; Wang & Ha, 2009) and applying their plan in practice (Dania & Zounhia, 2017) were considered time consuming and challenging. Only recently has Kinnerk et al. (2021) analyzed sport practitioners' GBA planning. Therefore, future studies may consider examining sport practitioners' GBA or CLA planning and subsequent application of the pedagogy.

Coaches/teachers experienced challenges when applying GBA pedagogy during games (Evans, 2012), adapting their session plan (Thomas et al., 2013) and questioning learners (O'Leary, 2014; Wang & Ha, 2009). Questions not addressing the tactical focus of the game (McNeill et al., 2004), not providing learners with enough time to respond (O'Leary, 2014), adopting the role of a facilitator, and engaging all students during questioning episodes (Díaz-Cueto et al., 2010), were all challenges associated with questioning. Nevertheless, there was evidence to suggest teachers did develop their questioning skills (McNeill et al., 2004) and in some cases effectively used questioning in their practice (O'Leary, 2016). With the evidence indicating sport practitioners require support with their questioning skills, the administration of alternative methods (e.g., verbal reports) may provide some different solutions to assisting practitioners with this pedagogic skill.

For PETE students administering CLA, using constraints to support learners' emergent behaviors and identifying behaviors that were less predictable during gameplay were initial challenges (Moy et al., 2019). Furthermore, practical challenges such as, equipment, space, class sizes, student absence, distractions, and students remembering previous lesson content, were all suggested to be constraining teachers' application of GBAs (Brooker et al., 2000; Cruz et al., 2012; McNeill et al., 2004).

When to address technical skills and potential lack of time focusing on such skills was another dilemma for coaches/teachers using GBAs (Harvey et al., 2015; Light, 2004). Roberts (2011) reported some coaches did not consider addressing technical skills as part of TGfU, while research evidence on trainee teachers (Forrest et al., 2012; Harvey et al., 2015) revealed their preference was to address technical skills first before the students played a game. Wang and Ha (2013) found pre-service and cooperating teachers considered technical skills should be taught before the game, whereas university tutors perceived

technical skills should be taught after the game. Overall, sports practitioners appear to require additional clarity on when to address technical skills during a GBA.

Despite these challenges, O'Leary (2016) reported an experienced high school male PE teacher aligned his lessons to TGfU and delivered developmentally appropriate games using modified equipment while supporting students technical skill execution when necessary. Similarly, Thomas et al. (2013) revealed the coach improved his ability in adopting the role of a facilitator along with his design and delivery of appropriate games. Thus, although pedagogical skills and knowledge is a challenging area, it is an area that can be developed.

Concept 3: Content knowledge

Content knowledge was found to be a factor associated with coaches' and teachers' perceptions and application of GBAs rather than CLA. In the study by Thomas et al. (2013), the coach was aware that having good tactical knowledge of rugby was necessary to apply a Tactical Games Approach. Similar evidence was found in other GBA studies (Brooker et al., 2000; McNeill et al., 2004; Roberts, 2011), with Gubacs-Collins (2007) suggesting the university tutor's tactical knowledge of games supported her questioning and implementation of a GBA. There was a paucity of evidence surrounding how content knowledge influenced PETE students' perceptions and application of CLA; with only two CLA studies included in this review. Moy et al. (2019) reported PETE students initially found it challenging to apply constraints to support students' emergent behaviors. This may have been affected by the PETE students possessing insufficient content knowledge to identify the constraints necessary to manipulate the learners' emergent behaviors. While further qualitative research evidence is required on what impact content knowledge has on sport practitioners' perceptions and application of CLA, coach/teacher education courses and researchers need to consider how GBAs and CLA can be applied by coaches' and teachers' who possess limited content knowledge of a sport.

Concept 4: Support

The term support is used here to encapsulate a myriad of factors that were reported to influence sport practitioners' perception and application of GBAs and CLA. Many coaches/teachers reported a willingness to develop their knowledge of GBA and CLA and apply this in their practice, regardless of levels of awareness and understanding (Díaz-Cueto et al., 2010; Evans, 2012; Moy et al., 2016). An important consideration here was that coaches'/teachers' *perceived* the pedagogies to support student/player learning in the affective (Dania & Zounhia, 2017; Evans, 2012; Pill, 2015), cognitive (Evans, 2012; Harvey et al., 2010; Pill, 2016) and psychomotor domains (Dania & Zounhia, 2017; Evans, 2012; Wang & Ha, 2013); however, these claims were empirically untested.

Pedagogical resources and training programs were recorded as the preferred mechanism of supporting practitioners' learning and understanding of GBAs, but the quality and value of these approaches was mixed. For instance, evidence suggested that although practitioners appreciated the resources provided to support them, the quality of these resources was questionable (Díaz-Cueto et al., 2010). Reid and Harvey (2014) concluded that sport coaches also wanted additional opportunities during training courses to apply Game Sense principles, while similar findings were reported among the teaching populations

(Rossi et al., 2007). However, Dania and Zounhia (2017) reported that the resources and training program were valued as effective methods for supporting teachers with TGfU. Moy et al. (2019) also revealed the support from the lead researcher and CLA resource provided to the PETE students assisted with their planning, application, and confidence to eventually plan CLA lessons without the aid of the resource or the researcher. However, it was reported that without the resource the PETE students found it more challenging to implement CLA. Therefore, resources and training programs designed to assist coaches'/teachers' understanding and application of these pedagogies need to be sufficiently constructed and provide clarity and assistance on the matters (such as those stated in the concept map) coaches/teachers require support with.

Confidence was found to affect teachers' perception and application of GBAs and CLA more than coaches. Díaz-Cueto et al. (2010) acknowledged teacher's confidence with TGfU developed as the study progressed, and that if they perceived students to be developing this supported their confidence in the pedagogy. For PETE students using CLA, they developed their confidence in planning and delivering their own CLA lessons without the aid of the lead researcher or CLA resource (Moy et al., 2019), highlighting that over time and with support teachers' confidence with these pedagogies can develop.

The evidence suggests coaches' and teachers' perceptions of GBAs are influenced by external factors, such as, club, policies, and curriculum (Light, 2004; Rossi et al., 2007; Wang, 2013). Moreover, coaches' perceptions on whether GBAs are a viable pedagogy to apply in practice appeared to be influenced by the pressures and demands of coaching in professional sport (Light & Evans, 2010) and the perception by players and parents regarding the role of the coach (Light, 2004). Interestingly, when coaches were not constrained by organizational pressures, evidence suggested there was a willingness to embrace a GBA pedagogy (Pill, 2015). Meanwhile, GBA studies mainly conducted outside of Europe, reported the culture of PE, and the curriculum was more aligned toward students mastering technical skills, which was impacting teachers' perceptions of GBAs (Wang, 2013; Wang & Ha, 2012a); however, this was not conclusive (Wang & Ha, 2013).

Lastly, the perception of others (i.e., players/students, parents, and colleagues) was found to influence coaches but mostly teachers' perception of GBAs. Observing colleagues (Wang & Ha, 2012a), receiving support from other professionals (Wang, 2013), parents (Pill, 2016) and positive feedback from students (Wang, 2013), encouraged teachers to continue applying GBAs. Conversely, a lack of support and feedback by these stakeholders was suggested to have an adverse effect on teachers' desire to use GBAs (Wang, 2013; Wang & Ha, 2012b). Therefore, teachers should be encouraged to observe their colleagues applying GBAs, and the influence of players' and parents' perceptions of GBAs and CLA on coaches'/teachers' views and application of these pedagogies requires further investigation.

Conclusion

The primary aims of this study were to conduct a systematic review and critically assess the methodological and theoretical research of sport coaches' and teachers' perceptions and application of GBAs, NLP, and CLA from 1982 to 2020. As reported in the meta-methods, the studies predominately included qualified or trainee teachers with most studies administering multiple qualitative methods. There was, however, a lack of evidence on community sport coaches, female coaches, coaches with a disability, and those coaching target, striking/

fielding, and net/wall games. Therefore, we must consider how inclusive this research is, given the dearth of evidence in certain coaching populations. The quality appraisal process revealed several methodological weaknesses of the included studies. We can only speculate as to why philosophical perspectives were not stated or why there was an absence of a theoretical positioning. One possible explanation could be that the requirements of the target journal and the journal editor/reviewer(s) requested this information be removed. If so, we would recommend journal editors/reviewer(s) reconsider this position, so we can improve the quality of future research publications. There was also a lack of longitudinal research designs, which, given some of the concerns raised in this review, could help future research activity that aim to administer interventions to support sport practitioners with their perceptions and application of GBAs and CLA. Longitudinal research designs have the potential to thoroughly examine, over time, the contextual factors that influence coaches' and teachers' perceptions and application of pedagogies. Thus, additional clarity on why, how and when sport practitioners are applying the pedagogies in practice can be examined and targeted support (e.g., interventions) can be administered if required.

The meta-synthesis identified four concepts (i.e., assumptions about learning, pedagogical knowledge and skills, content knowledge, and support) found to impact coaches'/teachers' perceptions and application of GBAs and CLA. Given that 40 years have passed since Bunker and Thorpe (1982) published their seminal paper on TGfU, many questions regarding coaches' perception and application of alternative pedagogies, such as GBAs and CLA remain unanswered. While this review adds to the body of existing knowledge, perhaps it is now time to reflect, and consider our future work and research endeavors. Finally, in the spirit of collegiality, some recommendations for future research and practice are presented below:

Recommendations for research.

- (1) Further examination of sport practitioners' perceptions and application of GBAs, NLP, and CLA, particularly from those who are currently underrepresented (e.g., female sport coaches, target, and striking/fielding coaches).
- (2) Use of alternative methods (e.g., verbal reports, think aloud) to analyze sport practitioners' decision-making and application of pedagogical components (e.g., questioning, manipulation of constraints) during practice.
- (3) Longitudinal studies aimed at analyzing the context-specific factors that influence sport practitioners' perceptions and application of GBAs, NLP, and CLA.

Recommendations for supporting practice.

- (1) To understand before we act. In other words, analyze sport practitioners' perceptions and application of GBAs, NLP, and CLA before designing and administering interventions to support them with the pedagogy.
- (2) Additional GBA and CLA resources that include videos and images which provide examples of tactical and pedagogical concepts being applied in practice by coaches and teachers delivering different sports. It is recommended that these resources are differentiated to support sport practitioners at different stages of their understanding and application of the pedagogies.

- (3) For sport practitioners who are not familiar with academic research, we consider the concept map to be a useful form of translational research that can aid your personal reflection on what factors may be influencing your perception and application of the pedagogies, thus helping you identify aspects of your practice that may require further professional development or support (e.g., from colleagues, parents).

Acknowledgements

The authors wish to thank Jackie Fealey (Academic Engagement Librarian at Liverpool John Moores University) for her support with the search terms and searching of the databases.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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