

A SCOPING REVIEW OF LITERATURE ON SPORT COACH EDUCATION PROGRAMS: AN INTERNATIONAL PERSPECTIVE FINAL REPORT

International Coach Development Research Team from Canada, UK, and Brazil

Majidullah Shaikh, Ph.D. (c)¹

Yura Yuka Sato dos Santos, Ph.D. (c)²

François Rodrigue, Ph.D. (c)¹

Vitor Ciampolini, Ph.D. (c)⁴

Larissa R. Galatti, Ph.D.²

Cassandra Seguin, Ph.D. (c)¹

Vinicius Z. Brasil Ph.D.⁴

Chao He, Ph.D.⁵

Diane M. Culver, Ph.D.¹

Christine Nash, Ph.D.³

Michel Milistetd, Ph.D.⁴

Karine Fournier¹

1- University of Ottawa, Canada

2- University of Campinas, Brazil

3- University of Edinburgh, United Kingdom

4- Federal University of Santa Catarina, Brazil

5- Jiangsu Second Normal University, China

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A scoping review of literature on sport coach education programs: An international perspective.

Executive Summary

There has been a lack of synthesis on the existence, effectiveness, and nature of sport coach education programs (CEPs) from a global perspective. As well, given the growth of CEP-related research in the past decade there is a need to amalgamate the results of these studies in order to identify key areas of importance and future directions to inform the improvement of current CEPs. The purpose of this project set out by the International Coach Development Research Team was to generate a greater understanding of sport CEPs that exist around the world, by reviewing literature from 2010-2019 found in English, French, Spanish, and Portuguese language journals. A scoping review methodology was carried out, which is a robust and systematic approach to reviewing literature to generate a broad understanding or descriptions of their contents. Criteria for inclusion included any literature that provided descriptions and/or evaluations of sport CEPs. Exclusion criteria included any non-specific program descriptions or evaluations, papers situated outside of sport coaching domain, papers related to the NCCP and the funding body for this project, any conference abstracts or theses/book chapters, and any papers in languages other than those of focus in this project. Phase I of this review involved collaborating with the University of Ottawa's librarian to develop a search strategy ([Appendix A](#)) and collect literature from eight relevant databases. At the end of Phase I, 3403 records were identified to move forward to the next phase. These records were amalgamated onto a shared review database known as Covidence. Phase II of this review involved screening each title and abstract of these records. Here, each record would require two collaborators to make a decision on it – using the inclusion/exclusion criteria – and any conflicts that arose were resolved by a third collaborator. At the end of Phase II, 398 records were identified to move on to the next phase. Phase III of this review involved collecting full-text copies of each record and screening them. Screening involved two collaborators making decisions on each record, using the inclusion/exclusion criteria, and any conflicts that arose were resolved between the two collaborators. At the end of Phase III, 109 records were selected for the next phase. The bibliography of these records are in [Appendix B](#). Phase IV of this review involved extracting relevant data from the full-text copies of each record into a consolidated spreadsheet. Data included: Authors and year, title, purpose, country, participants and contexts, delivery model, type of research, methodologies, results, and other general findings. These data are displayed in [Appendix C](#). Phase V was a supplementary phase conducted to identify, select, and extract data from any policy and program descriptions that may help to conceptualize the CEP-papers generated from Phases I-IV. Phase VI involved the synthesis of key issues from across the records to help generate a greater understanding of the nature and existence of CEPs across the globe. Three analyses here were performed: (a) content analysis on studies with evaluations, (b) qualitative description of CEP evaluation results, and (c) qualitative descriptions of policy literature and CEP program descriptions. The results of the content analysis consisted of a mix of frequency and descriptive statistics, and were divided into three sections: (a) context and participants, (b) program design, and (c) methodology and methods. The results of the description of CEP results consisted of three themes related to the types of evaluation research, and their sub-themes: (a) outcome: changes in knowledge and skills, behaviour change, attitudes, confidence, and intentions, and athlete outcomes), (b) process: facilitators to learning, challenges to learning, and

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mediums of training, and (c) implementation: facilitators to delivery, challenges to delivery, and suggestions for program improvement. The results of the program descriptions and policy literature consisted of four themes: (a) descriptions of national and regional sport federations/associations CEPs, (b) policy accreditation of international sport federations, (c) policy accreditation of national governing bodies, sport federations, and Olympic committees, and (d) policy accreditation of Portuguese and Spanish-speaking countries.

Background

Sport coach education programs (CEPs) are one of the most commonly used structured environments to promote coach development. In Canada and the United Kingdom, much work has been done on the design, development, delivery, and consistency of coach education programs on a national level; However, in many other countries, sport CEPs vary considerably in these factors (Lyle, 2007). In the past decade, the existing reviews in this area have focused on specific coach education programs and interventions related to improving interpersonal behaviours (e.g., Evans, McGuckin, Gainforth, Bruner, & Côté, 2015; Langan, Blake, & Lonsdale, 2013), overviews of select programs (e.g., Callary, Culver, Werthner, & Bales, 2014), and current issues (e.g., Trudel, Milistetd, & Culver, 2020). No reviews have been carried out to explore what coach education programs are being conducted and evaluated across the international literature base. This is important to understand given the scarcity of reviews that have taken into context the provision and nature of CEPs across the globe.

This work will help to address two major gaps in current understandings:

- a) Based on the sparsity of information and the number of publications in different countries/languages a scoping review is needed to synthesize understandings of these CEPs (Trudel, Milistetd, & Culver, 2020).
- b) Understanding the provision of programs and policies that exist beyond the Coaching Association of Canada's National Coaching Certification Program (NCCP).

For the purposes of this scoping review a sport coach education program was defined as any educational learning environments (e.g., workshops, lectures, seminars, webinars, interventions, etc.) focused on the education of sport coaches for the purpose of developing or enhancing their coaching practice. This definition was deliberately wide and inclusive to inhibit academic bias and allow for grey literature.

Research Objectives

The purpose of this research was to generate a scoping review of relevant academic and policy literature related to sport coach education programs published internationally, between 2010 to 2019. Specific objectives: Review and synthesize relevant literature across four languages – English, French, Portuguese, and Spanish.

1. Identify the types of studies conducted (e.g., Implementation, process, or outcome research? What was being measured?)
2. Identify the methodologies: *how* the studies were conducted (e.g., How was impact measured?)
3. Identify the results across these studies (e.g., What are the impacts? What's working and what's not working? Barriers and facilitators to learning? – The results will again depend on whether this is implementation/process/outcome research)
4. Interpret key issues across the literature (e.g., Generate a general understanding of what is out there)

5. Generate a general understanding of certification policies (e.g., This step will help to contextualize the preceding academic objectives)

Methods

The pre-stages of this review involved meetings amongst the collaborators to discuss the scope of this study. It was established that along with the criteria provided by the Coaching Association of Canada, also known as the CAC (i.e., a scoping review of non-NCCP related programs from an international perspective), the collaborators would also make effort to:

- Explore literature across different forms of CEPs (e.g., degree programs, established programs, non-established workshops and seminars, small to large scale CEPs, etc.), to prevent bias for only established formal CEPs.
- Limit the language scope to the English, French, Portuguese, and Spanish languages given the language capabilities of the collaborators while also allowing for breadth.
- Develop inclusion and exclusion criteria that help to best answer the research question

A scoping review methodology was undertaken which involves exploring the extent, range, and nature to which sport coach education programs exist and their effectiveness. This methodology was chosen in lieu of its sister method, the systematic review, which is more appropriate to use when answering clearly defined questions (Tricco et al., 2018). In contrast, the scoping review methodology is appropriate here given the broad nature of this project's research question, and the heterogeneity of sport coaching literature in terms of the discipline and the methods used (Lyle, 2014).

Trustworthiness and Quality: This review was carried out and assessed using quality criteria outlined in the most recent PRISMA-ScR guidelines (Tricco et al., 2018).

Review Protocol

Outlined below in this paper is the review protocol used to generate the records that were selected for inclusion in key knowledge synthesis. This comprised of six stages:

- Phase I – Search strategies;
- Phase II – Screening titles and abstracts of the literature;
- Phase III – Screening full-text copies of the screened literature;
- Phase IV – Data extraction;
- Phase V – Supplementary phase: policy literature searches and screening;
- Phase VI – Synthesis and summary of key issues.

Although these stages are described in the order they were carried out, across these stages an iterative approach was taken to make sure that an appropriate list of articles were selected for data extraction and synthesis.

Phase I – Search Strategies

A meeting was scheduled with the faculty librarian at the University of Ottawa to discuss her potential collaboration. From here, we worked with the librarian to devise a specific search strategy to answer the research questions (See search strategies in [Appendix A](#)) within the English, French, Portuguese, and Spanish languages. The librarian carried out all the searches in each database and the results of this search are below:

- SportDiscus: **1081**
- Sports Medicine & Education Index (formally: Physical Education Index) (Proquest): **818**
- Medline (Ovid): **436**
- Embase (Ovid): **581**
- PsycInfo (Ovid): **1041**
- SciELO Citation Index (Web of Science interface – Clarivate Analytics): **24**
- LILACS: **77**
- Web of Science Core Collection (Clarivate Analytics): **1409**

Once all the databases results were merged, there were **5467** references. The article list was then compiled in Covidence, a review management application, and then duplicate records were removed using the automatic duplicate records removal function in Covidence as well as manually removing records after reviewing the remaining references list using EndNote X8. A total of **3403** records remained for the initial screening stage.

Phase II - Screening Titles and Abstracts of the Literature

Four team members then went through the list in Covidence and screened the titles and abstracts based on the inclusion and exclusion criteria outlined below:

- Inclusion criteria:
 - Description or evaluation of specific sport coach education program(s)
 - Exploration of any of these factors:
 - Implementation factors (e.g., What the program is, who delivers it, how it was designed),
 - Process factors (e.g., How the program is delivered, how features of the program lead to program outcomes)
 - Outcome factors (e.g., How the program impacts coaches who participate in it)
 - Description of certification policies
- Exclusion criteria:
 - Reason 1: Outside of the sport coaching domain
 - Reason 2: Irrelevant to the topic of sport coach education programs
 - Reason 3: Any non-specific program descriptions (e.g., coaches' perceptions of their non-specific coach education experiences in their lifetime as coaches), or any results/descriptions that cannot be directly tied to specific coach education program(s)

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- Reason 4: Any needs assessments (e.g., surveying knowledge or perceptions of coaches in a certain domain to see if they desire/need coach education)
- Reason 5: Does not include any evaluation or empirical studies of sport coach education programs
- Reason 6: Any program involved with the NCCP
- Reason 7: Theses and book chapters
- Reason 8: Conference proceedings
- Reason 9: Languages other than those focused on in this review
- Reason 10: Duplicate study
- Note: The reasons are numbered here to help differentiate them in the [Flow Diagram](#).

At least two members separately assessed each of these titles and abstracts. Conflicts were resolved by a third member of the team. Once this stage was completed, **398** records were identified to move on to the next screening stage. See [Flow Diagram](#). This phase was completed by the end of May 2019.

Phase III - Screening Full-text Copies of the Screened Literature

This stage involved all team members to take on a portion of studies to retrieve the full-texts and assess them following the same inclusion and exclusion criteria outlined previously. Like the previous phase, at least two members are separately assessing each full text. Once this stage was completed, **109** records were selected for extraction. See [Flow Diagram](#). This phase was completed by the end of August 2019.

Phase IV – Data Extraction

This stage involved comprehensive review of each record and extracting the necessary data to address the research questions of this study. Here, the data were extracted and compiled into a large table. The extracted information included authors and year, country, participants and contexts, delivery model, type of research, methodologies, results, and other general findings. See [Appendix C](#) for more details. This phase was completed by the end of September 2019.

Phase V – Supplementary Search and Screening of Policy Literature

Searches were conducted for policy literature **from 2010 to 2019** through the following resources:

1. Government documents and reports at the federal/national level
2. Databases identified for academic searches
3. Web searches - Google and Google Scholar
4. Reference lists of the literature identified
5. Websites of national and international federations that deliver coach education
6. Consultation and recommendations from others

Along with the keywords and equations used for searches in the academic literature, potential keywords in these policy literature searches included the term ‘policy’ in conjunction with

‘document’, ‘education’, ‘report’, ‘program’, OR ‘framework’. These keywords were searched by joining search terms using the operator ‘AND’, using the ‘Find...’ or CTRL+F functions on webpages and electronic resources, or manually scanning webpages and resources.

In Portuguese and Spanish speaking Countries (n=30) there are different pathways to be certified as a coach (e.g., Argentina and Chile have Higher Education and specific Coaches Association/Federation programs). The top ten ranked countries in medal count in the last Olympic Games Rankings (Summer/Winter) were chosen to search for information from national websites (Olympic Committee, Specific Sports Federations / Coaches’ associations, etc.). Inclusion criteria include any relevant descriptions of certification policies.

By the end of August 2019, the following searches were completed:

- Completed the English policy literature search (identified potential sources – Olympic federations, government databases)
- Completed the French policy literature search (identified potential sources - government databases, NOC, NCA, NMSO)
- Completed Portuguese/Spanish policy literature search (identified potential sources – national websites of Olympic committee and sport federations/coaches’ associations).

The policy literature were then extracted into a table with columns labelled for authors and year, title, purpose, country, contexts and/or participants, delivery model, levels, descriptions, and other general findings. See [Appendix D](#) for more details. This phase was completed by the end of September 2019

Phase VI - Synthesis and Summary of Key Issues

A comprehensive synthesis and summary of key issues across the selected records and policy literature was conducted. This involved the use of both quantitative and qualitative data analyses.

Content analysis on studies with evaluations. The table compiled in Phase IV – Data Extraction ([Appendix C](#)) was then further categorized and quantified in Microsoft Excel. Of the 79 selected records, 70 of these studies were considered *Evaluation Studies*, while 9 others were labeled as *Program Descriptions and Protocols*. With the Evaluation Studies, the existing categories from the extracted information table were then further split into several specific categories. For example, the category “Participants and Contexts”, was further deconstructed into multiple categories such as participant roles, age range, gender, ages of athletes’ coached, sport context, level. Similarly, “Program descriptions” were further segmented into categories such as focus of CEP, and scale of CEP. All data were then quantified (e.g., for sport type, soccer = 1, basketball = 2, and so on). These deconstructed data were then transferred for analysis in SPSS 25 (IBM Corp., 2017). Descriptive statistics related to participant data were calculated, and frequency statistics were calculated for all other categories. The descriptive and frequency statistics were then prepared for description in text and in tables throughout the Results section.

Qualitative description of studies with evaluations. The table compiled in Phase IV – Data Extraction ([Appendix C](#)) was transferred to NVivo 12 (QSR International, 2017), a qualitative computer

data analysis program. A deductive-inductive approach (Miles & Huberman, 1994) was conducted with these data. Here, three themes were created deductively – Implementation, Process, and Outcome – based on the types of evaluation research identified for this study. Any passages of the extracted results were then inductively coded under an identifying a label (e.g., gains in content-related knowledge), and then categorized deductively under one of the three major themes. All passages throughout the results were coded under labels and categorized in this manner. When passages represented the same concept, they were put under the same label. This was an iterative process in which labels were re-named, moved, or removed at the analysts' discretion. This process continued until all the results were labeled and categorized appropriately. The results of these themes were then summarized and displayed in text in the Results section.

Qualitative descriptions of policy literature and CEP program descriptions. The data compiled in the Phase V – Supplementary Search and Screening of Policy Literature ([Appendix D](#)), as well as the data extracted from *Program Descriptions and Protocols* from the content analysis described above, was transferred to an Excel Spreadsheet and a dynamic table was created. The literature were then categorized into *Program Descriptions and Protocols* and *Policy literature*. A deductive-inductive approach (Miles & Huberman, 1994) was then conducted with the extracted data for each body of literature. This was an iterative process in which labels were re-named, moved, or removed at the analysts' discretion. Two themes were deductively created for the Program Descriptions and Protocols: (a) implementation plans and protocols, and (b) implementation descriptions. As well, two themes were deductively created for the Policy Literature: (a) Policy accreditation of international sport federations, and (b) Policy accreditation of national governing bodies/sport federations /Olympic committees; these were based on the jurisdiction of the institutes responsible for the coaches' accreditation identified in the results extracted. Then, subthemes were created based on the specific institute or country responsible for the program accreditation.

Results

Note: For the purpose of readability, throughout the results section any references to specific selected literature are numbered based on their alphabetical order in the Bibliography of Selected Records ([Appendix C](#)).

Content Analysis on Studies with Evaluations

Context and Participants

Frequency statistics of the contexts and participants across the CEPs were calculated and are displayed in [Table 1](#). Data were collected on programs from 18 different countries with the United Kingdom (20 studies, 25.32%), the United States of America (14 studies, 17.72%) and Australia (8 studies, 10.13%) being the top three countries where programs were situated. The level of competition in which CEPs were situated were most commonly recreational settings such as community and afterschool programs, summer camps, and grassroots interventions. Soccer was the most popular sport context of study (16 studies, 22.86%). It was not uncommon in the studies selected to find CEPs catered to coaches who practiced across various competitive levels (15 studies, 21.43%), and across various sport contexts (15 studies, 21.43%).

In most studies, participants were primarily coaches (64 studies, 81.01%). Forty-four studies involved male participants, while 35 of the studies involved female participants. However, out of a total of 3413 participants that were reported across studies, 1911 (56%) of these participants were reported male ($M_{\text{male}} = 43.44 \pm 65.41$ per study), while 450 (13.20%) were reported female ($M_{\text{female}} = 12.88 \pm 17.63$ per study), and 1051 (30.79%) participants' genders were unreported or unspecified.

These findings may suggest a few insights:

- Coaches are more often male
- Males were more often involved in these CEPs
- Males were more often involved as *participants* in these studies
- The studies involved more male-dominated contexts/sports studies
- The larger-scale programs, which may be more prevalent in male-dominated contexts, capture more participants for evaluation which may have skewed results
- The literature reflects the male-dominant status of sport coach education across the globe.

Participants reported ages averaged between 8 and 51 years old ($M_{\text{age}} = 35.36 \pm 7.48$ years old) and reported coaching experience averaged between 2 and 19 years ($M_{\text{experience}} = 8.75 \pm 4.05$ years of experience). Finally, participants were coaching or were being trained to coach primarily children (ages 12 and under, 34 studies, 48.57%) and adolescents (ages 13-17 years old, 36 studies, 51.43%).

At least 17 of the selected studies also involved a secondary set of participants who were most often athletes or students (e.g., an outcome study where coaches and athletes both complete self-report measures after the CEP). Of these studies, 12 involved male participants and 8 involved female participants. In total, 697 secondary participants were reported in these studies, with 459 (65.89%) of these participants reported male ($M_{\text{male}} = 38.27 \pm 31.39$ per study), while 165 (23.64%) were reported female ($M_{\text{female}} = 20.60 \pm 24.56$ per study), and 73 (10.47%) participants' genders were unreported or unspecified. Secondary participants reported ages averaged between 8.22 and 44.86 years old ($M_{\text{age}} = 20.61 \pm 3.26$ years old).

Table 1: Context and Participants

Country of CEP	#	%
Australia	8	10.13
Belize	1	1.27
Brazil	4	5.06
Canada	7	8.86
Denmark	2	2.53
Finland	1	1.27
France	2	2.53
Lithuania	1	1.27
Netherlands	1	1.27
New Zealand	2	2.53
Norway	6	7.59
Portugal	1	1.27

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Singapore	3	3.80
South Africa	1	1.27
Spain	6	7.59
Ukraine	1	1.27
United Kingdom	20	25.32
United States of America	14	17.72
Level of Sport	#	%
Recreational	16	22.86
Competitive	3	4.29
Elite	6	8.57
Professional	8	11.43
National	2	2.86
Elementary school	3	4.29
High school	3	4.29
University	1	1.43
Mixed	15	21.43
Unspecified / Not applicable	13	18.57
Sport in the Context	#	%
Soccer	16	22.86
Basketball	7	10.00
Football (American)	4	5.71
Rugby	4	5.71
Swimming	2	2.86
Hockey	2	2.86
Track & Field	2	2.86
Cricket	2	2.86
Football (Australian)	1	1.43
Baseball	1	1.43
Alpine Ski	1	1.43
Handball	1	1.43
Mixed	15	21.43
Unspecified/Non-sport specific	6	8.57
Participant Role in the Context	#	%
Coaches	64	81.01
Athletes	11	13.92
Student-Coaches	10	12.66
Program Facilitators / Coach Educators	5	6.33
Other (e.g., teachers, administrators, parents)	8	10.13
Age of Athletes in the Context	#	%
Children (12 and under)	34	48.57
Adolescents (13-17)	36	51.43

Young adults (18-25)	10	14.29
Adults (25+)	2	2.86
Unspecified / Not applicable	22	31.43

Program Design

Frequency statistics of program designs were calculated and are displayed in [Table 2](#). The most common foci of the CEPs concerned Interpersonal coaching components (19 records, 27.14%), such as training coaches to theory related to autonomy-supportive and positive motivational climates,⁴⁰ self-determination theory,^{40,41} relation-inferred self-efficacy,⁵⁹ empowering behaviours,⁶⁰ and/or transformational leadership,^{66,67}. CEPs were also commonly situated in educational contexts (e.g., either through classes, courses, or full degree programs) to promote coach development (17 studies, 24.29%) in areas of theories and principles of coaching, planning, and goal setting. A third most common focus was sport-specific coaching practice (11 studies, 15.71%), which involved training to improve technical and physical skill-building, strategies and tactics, and sport-specific skill development.

Often these programs were small-scale interventions or workshop, targeting specific groups of coaches within a local club or organization (35 studies, 50%). Large-scale CEPs were those that spanned across multiple clubs/sites within an organization or were state/national certification programs (23 studies, 32.86%). University-scale CEPs were often situated within an institution as a class, course, or degree program (12 studies, 17.14%). Most commonly these CEPs were delivered in-person by a facilitator or coach educator (56 studies, 80%).

Table 2: Program Design

Focus of CEP	#	%
Interpersonal	19	27.14
Education/Development	17	24.29
Sport-specific coaching practice	11	15.71
Life skills	8	11.43
Risk prevention	8	11.43
Mental skills	4	5.71
Ecological	1	1.43
Equity	1	1.43
Nutrition	1	1.43
Scale of CEP	#	%
Small	35	50.00
Large	23	32.86
University	12	17.14
Delivery Mode	#	%
In-person	56	80.00
Online	4	5.71
Both	5	7.14

Methodology and Methods

Frequency statistics of the methodologies and methods used were calculated and are displayed in [Table 3](#). The literature selected varied in the amount of specific information offered with regards to the research designs or approaches used, and the specific data collection and analysis techniques used. For this reason, much of the analysis gathered here was interpreted based on the descriptions provided, rather than specifically or explicitly mentioned in the majority of the literature.

The types of evaluation research were categorized as either implementation research (e.g., evaluation of program delivery), process research (e.g., evaluation of links between program delivery and outcomes), or outcome research (e.g., evaluation of impacts of CEP on participants). Some articles would include one, two, or all three types of evaluation research. Overwhelmingly, most evaluation research focused on understanding or analyzing outcomes (61 studies, 87.14%). Studied to a lesser degree were process (31 studies, 44.29%) and implementation (19 studies, 27.14%), pointing to the idea that studying the effectiveness and impact of CEPs may be more popular to study than the other types of research. This may be partly due to the practicality of conducting outcome studies, in that they can often be retrospective in nature with already gathered data, in contrast to implementation and process research which may require more prospective means of study. The nature to which these components were described is detailed in the [next section](#).

The studies varied in the research approaches used, which constituted of qualitative (32 studies, 45.71%), quantitative (20 studies, 28.57%), or mixed methods (18 studies, 25.71%). Some studies adopted multiple research designs (e.g., action research with single-subject experimental design and case study design). A considerable number of studies adopted generic qualitative methodologies (i.e., studies that were qualitative or interpretivist in nature but no clear methodological approaches were specified; 33 studies, 47.14%). Fourteen studies (67.14%) involved action research, which are characterized by collaborative research design between researchers and those within the context to design and implement CEPs, and mobilizing actionable change within the context. To a low extent were qualitative studies specific to traditional qualitative approaches like phenomenology, ethnography, and grounded theory (6 studies, 8.58%). Experimental designs comprised on single-subject/single-case study designs (11 studies, 15.70%), quasi-experimental (7 studies, 10.00%), or randomized controlled trials (3 studies, 4.29%). Observational designs, which often involved no intervention on the part of the researchers', comprised of survey designs (9 studies, 12.86%), case study designs (9 studies, 12.86%), and observational designs (7 studies, 10.00%). In terms of time frame, study designs were often prospective in nature (36 studies, 51.43%), with multiple data collection techniques used to gather data over time (at the beginning, during, and/or end-of-CEP/follow-up). The most popular data collection techniques were semi-structured interviews that were conducted either on the phone or in-person (36 studies, 51.43%), self-report questionnaires where ratings are completed on scales like Likert, yes/no, true/false questions (26 studies, 37.14%), and observations using field notes or a rating system (16 studies, 22.86%). Several other techniques used are outlined in Table 3 below.

Table 3: Methodology and Methods

Type of Evaluation	#	%
Implementation	19	27.14
Process	31	44.29
Outcome	61	87.14
Research Approach	#	%
Qualitative	32	45.71
Quantitative	20	28.57
Mixed-method	18	25.71
Research Design	#	%
Exploratory designs		
Generic qualitative methodology	33	47.14
Action research	14	20.00
Phenomenology	3	4.29
Ethnography	1	1.43
Grounded theory	1	1.43
Historical	1	1.43
Experimental designs		
Single-subject	11	15.70
Quasi-experimental	7	10.00
Randomized controlled trial	3	4.29
Descriptive designs		
Survey design	9	12.86
Case study design	9	12.86
Observational design	7	10.00
Time Frame	#	%
Cross-sectional	15	21.43
Retrospective	19	27.14
Prospective	36	51.43
Data Collection Techniques	#	%
Semi-structured interviews	36	51.43
Questionnaire (Scales)	26	37.14
Observations (Field notes, rating systems)	16	22.86
Questionnaire (Open-ended)	15	21.43
Focus groups	14	20.00
Artifacts (Documents, forms)	12	17.14
Meetings and communications	3	4.29
Observations (Video)	3	4.29

Qualitative Description of CEP Evaluation Results

Outcomes

Knowledge and skills. The selected records reported improved knowledge of CEP participants related to conceptualizing and reflecting on coaches' own philosophies. Here, knowledge gains included how to develop one's own coaching philosophies in terms of balancing values and priorities of the context,^{34,68} pedagogical awareness,⁶⁸ and athletes' needs.^{4,54} These conceptual models were similar to coach mental models proposed by Côté, Young, North, and Duffy (2007). In line with this, the CEP-participants in these studies also gained knowledge of the importance of reflection in refining and evolving coaching philosophies, and strategies to adopt reflective practice in their coaching.²³ Knowledge gains were also identified in adopting or reinforcing new knowledge. Primarily, these topics focused on improving interpersonal coaching philosophies and strategies like coach-athlete relationships,^{7,11,20-22,32,43} communication,^{20,28,41} developmentally appropriate practices,¹⁷ values-based teaching,³⁷ autonomy-supportive coaching,^{42,54,60} transformational leadership behaviours,⁶⁶ social values,⁴³ and teaching life skills.^{8,11,20} Other specific topics included coaching technical/sport-specific skills,⁴⁶ sport injury prevention,^{9,25} smoking prevention,²⁴ nutrition,⁴ equity training,⁵¹ and career knowledge.^{2,28,36,65}

Behaviour change. Another reported outcome was participants' behaviour change post-program. These included participants' use of strategies related to what was taught or trained in the CEP with studies reporting greater adoption and integration of CEP-specific curriculum models and program protocols.^{43,50,65} As well, studies reported increases in specific strategies and coaching behaviours related to autonomy-supportive coaching, technical skills teaching, life skill development, transformational leadership, empowering behaviours, and relationship-building.^{8,12,61,65,67,13,15-17,19,24,32,49} Many of the studies that did not include post-CEP support reported that participants did not change behaviours or adopt effective program implementation.^{19,39,40,60-62} An important difficulty that was reported was the challenge for participants in adopting uni-dimensional approaches to coaching when participants are more inclined to complex, multi-dimensional approaches to coaching. Here, when one-size-fits-all approaches were introduced to participants in CEPs, without these approaches either adapted to the participants' contexts, or packaged in a manner that allows for integration of strategies and knowledge to coaches' already-existing practices, this was associated with challenges to participants' adoption of approaches.^{13,14} Other common challenges to changing behaviours or implementing workshop-content into practice included infrastructure-related barriers (e.g., not enough environmental resources to implement a specific program)⁹ and time limitations (e.g., busy coaching schedules, limited time between competitions, difficulty integrating novel components into established session timetables).^{38,48}

Attitudes, confidence, and intentions. It was also reported in many of the selected studies that attitudes of participants changed after attending these CEPs. One prevalent theme here was advocacy – where studies reported participants' belief in the value and importance of the content for practice.^{9,20,31,37,42,54} However, in some studies, participants did not report changes in attitudes; of these studies, many reported harmony of content with their current approaches to coaching. Here, participants reported that CEPs helped to reinforce their existing beliefs rather than learning and

adopting novel approaches or strategies. Few studies also reported increased confidence and self-efficacy of participants related to their knowledge of CEP-content.^{4,10,19,20,24,30,31,37,38,59} Finally, few studies reported outcomes related to CEP-participants' intention to change their coaching approaches or adopt new behaviours, strategies, and curriculum-content in their practices.^{1,26,31,32,38,43,54,55} However, given that many of these studies were cross-sectional or retrospective in nature, where CEPs had already been completed, results that offered information on intentions to change behaviour, were often not followed up by assessments of whether – and to what extent - these intentions were fulfilled or not.

Impacts on athletes and youth sport participants. Almost all studies that involved athletes and youth sport as participants reported results related to athletes' self-perceptions of psychosocial concepts such as improvements in life skills, pro-social behaviours, and satisfaction of basic psychological needs (e.g., autonomy, competence, relatedness).^{2,16,20,29,30,32,43,54,67} Only a handful of studies looked at athletes' physical or sport-specific skill development or behaviour change. Some studies also looked at athletes' views of coaches' behaviours, with most reporting improvements or positive benefits after the coaches' involvement in the CEP.

Processes

Facilitators to learning. One of the most reported methods of enhancing learning in the CEP was the use of *practical and relevant learning components*, like the use of demonstrations and examples related to practice, reflective components (e.g., written logs),³⁴ incorporation of multi-media content (e.g., video examples)¹⁷, and examining case-method scenarios.^{57,66} This problem-based learning helped to make content more relatable and applicable to participants' practice.^{44,65,66} Many studies that mentioned a lack of these practical components also mentioned an association with lower effectiveness of learning; often these studies would offer suggestions and recommendations here would relate to incorporating more practical and active learning components to create environments further conducive to learning.^{9,22,24,37,40,65} In one unique study, Morgan, Jones, & Gilbourne,⁵⁰ used ethno-drama to depict lived realities. The coaches in this study cited enjoying the emotional and contextual complexities of the lived experiences/performances, and that it helped them to view coaching as a complex social activity.

Another enabler was engagement in *social learning interactions*, where many participants reported that discussions and sharing of ideas in group settings was important to help expose them to multiple different perspectives and engage in co-learning experiences. In university-based CEPs, students are often part of a team and able to build relationships with one another over time, another means of enhancing learning.^{34,45} Re-visiting the ethno-drama study,⁵⁰ the dramatized scenarios offered considerable interaction and discussions among the coaches and the opportunity to engage in the issues presented; these dramatized scenarios gave the coaches further insight into the theories previously introduced.

A third method was the *incorporation of feedback and reflection* to help reinforce learning.⁴⁴ These reports are aligned with research that suggests coaches prefer training workshops that incorporate active learning opportunities (e.g., social interactions, problem-based learning, reflective practice; Lemyre, Trudel, & Durand-bush, 2007; Nelson, Cushion, & Potrac, 2013; Trudel & Gilbert,

2006; Wright, Trudel, & Culver, 2007). The theme of feedback is also paired with social interactions; for example, in university-based CEPs, meetings with the course professors and their peers during the semester was an important component to share experiences and ideas regarding their internship and receive and provide feedback.^{45,48} However, this aspect can be a detrimental when group discussions are structured but participation by peers in these discussions is low.⁴⁸ Other important facilitators that were discussed were progressive structure of CEPs (e.g., learning theory, then content, then strategies, then practice), and incorporating follow-up sessions to facilitate ongoing learning.

Challenges to learning. More positive facilitators were reported than barriers to learning. However, when reported, a common challenge was that when content was not catered or *adapted to sport coaches' practice* or their *professional needs*, the studies' reported difficulty in coaches' uptake of CEP-related content and behaviours.^{22,42,47,49} This was especially true when CEPs would adopt lecture-based styles of delivery or have participants adopt uni-dimensional approaches without consideration of coaches' contexts or sport backgrounds. However, in contrast, some studies cited that specificity made content difficult to generalize when coaches were from a variety of contexts.⁵⁰ This points to the idea that the educators should address both the coaches' needs and the environment in which the coaches operate to enhance learning. A second major challenge was *time limitations*. The CEPs were often limited by the time available to facilitate training, which commonly meant these CEPs would focus more on increasing participants' knowledge of the content and curriculum, with little opportunities to practice strategies or implementation of CEP-content.^{24,34} A third challenge reported was the *lack of ongoing provision* to help continue and reinforce learning post-CEP participation. Implementation support and mentoring were valued by participants in their ongoing learning – in alignment with sport coaching research (Bloom, 2013, Lemyre, 2007) - however these components were not always offered as part of the CEP. In line with this support would be the need for ongoing feedback; lack of this feedback can discourage coaches' motivation or deviate understandings of their expectations.² Other challenges and suggestions for improvement were offering more freedom with the content, using less scientific jargon, and considering person-centred approaches with an understanding of the backgrounds and experiences coach participants bring in to the learning environment.

Medium of training. Three major mediums were focused on for learning: (a) In-person CEPs (e.g., workshops, modules, seminars, brief interventions, non-university programs), (b) online CEPs (e.g., webinars, online courses), and (c) University-based CEPs (e.g., bachelor's in sport coaching). One of the major benefits cited of participation in in-person CEPs was engagement in active learning opportunities, as discussed previously. However, an alternative benefit that came from participation in online CEPs was communication and engagement at participants' own convenience. This offered time for participants to reflect and engage for longer than they would have in rapid-fire conversations characteristic of in-person CEPs. It also allowed opportunities for more hesitant participants to engage where they may otherwise refrain in in-person settings,⁴⁸ as well as for enhancing distance-learning opportunities.⁴⁴ A few studies suggested that in-person CEPs should offer online components as well²², and diversity and variety in online offerings (e.g., various drills, practical strategies, videos of strategies;⁴⁸ this alludes to the idea that modern CEPs may benefit from incorporation of both online and in-person components to learning.

A unique feature of university-based CEPs was the internship piece, which were often the most valued learning piece for students.^{45,46} This component of these CEPs allowed exposure to real-world contexts of sport coaching regarding communication, dealing with athletes, organizing the group for competitions, and opportunities to use practice strategies learned through the CEP on an ongoing basis.

Implementation

While implementation of CEPs were often discussed, this component was more difficult to categorize. Often, implementation overlapped with process; evaluations here would focus on how well implementation features related to outcomes for the CEP participants. There was less focus on the facilitators and challenges to actually delivering these implementation features or curriculum components. When discussed, this usually involved processes involved in defining CEP objectives and skills to build on, evaluations of fidelity of CEP-implementation, and evaluations of the quality of delivery of learning.

In general, the results of these studies often involved offering suggestions to readers to improve implementation, such as saving time in the program for offering feedback, using more visual support materials, offering shorter sessions (as opposed to lengthy delivery), and that theory should be shorter and condensed. The results of the studies also suggest that use of practical examples and strategies can be helpful, and to offer more opportunities for coach learners to interact with peers; however while these suggestions would help contribute to coaches' learning processes, there is little regard for the instrumental resources and time commitment required to design and implement such practical strategies – which may be why more lecture-based, passive strategies are preferred in these scenarios.

Facilitators of CEP delivery. Including *ongoing learning* components were an important delivery piece of effective CEPs. Of the strategies outlined, these included developing a community of practice, group discussions, mix of face-to-face meetings with online meetings, follow-up sessions beyond the CEP.^{34,39} These different learning formats helped to contribute to increased effectiveness of CEPs in helping participants realize the course's stated learning outcomes, and allowed for ongoing sharing of experiences and co-learning.^{34,40,57} In the group discussions of the CEP described by Jones et al.,³⁴ even though the discussions were initially pre-structured by the tutors, they soon followed the students' experiences of everyday coaching. Specific programs for developing coach educators, like coach development officer programs, were cited as increasingly important as they provide key support in facilitating coach development and training.^{52,61} The students thus felt obliged and engaged within an on-going learning process, where it was deemed important to experience every step. Other facilitators included *initial communication* to enhance expectations and preparation for workshop by CEP participants,⁵⁸ the importance of *stakeholder support*,⁶¹ and *use of unique learning strategies* like case-method teaching⁵⁷ and flash cards³⁷ were found useful for enhancing training quality.

Challenges of CEP delivery. *Time limitations* were a significant factor that challenged the delivery and use of content or behaviour change beyond the CEP. In the selected records, many CEPs reported limited time of the workshop session itself,^{58,61} which led to limited perceived time to hinder learning, transfer of values and integration of theory into practice,^{34,38} and reflection on a weekly

basis.³⁴ Authors offered several suggestions for improving time limitations, such as shorter sessions over multiple modules,^{9,22} condensing theory and focussing more on practice,²⁴ and follow-up sessions offered by programme providers beyond CEP to make-up for content missed (another example of *ongoing learning*),⁶¹. This would help to ensure that participants (coaches) were not flooded with too much information given the high density of content^{39,65}, and offer more time for peer discussion and interaction.⁶⁵

Resource limitations included the size of the learning environment, which contributed to difficulties in delivery; recommendations here were to include a smaller number of participants in the CEP.²² Another limitation was the educator missing elements of the curriculum at the time of delivering the CEP, which contributed to the not-as-planned delivery of the CEP⁹ – this alludes to the importance of sufficient preparation in increasing the perceived quality of a CEP to participants.

Suggestions for program improvement

Along with the suggestions for program improvement listed throughout these results, here are some bullet points of other key features of programming that may be helpful to include:

- Interventions should be based on thorough assessment of specific setting (inclusive of clubs values and assumptions)⁴²
- Training curriculum should reflect the perspectives of cultural insiders⁷⁰
- Intervention should aim to create and maintain a strong and coherent organizational cultures (macro level); intervention should aim to treat athletes as whole humans and not just as athletes (micro – human).⁴²
- Delivering intrapersonal skills require a two-pronged approach: an understanding of the self and the impact on others²¹
- More content should include how to answer children's questions²⁴
- Modules should add a topic for study that addresses preconceived notions of proper coaching³⁹
- Training should be offered to apply new technologies to the observation, analysis and management of training and competition⁴⁷

Qualitative Description of Program Descriptions and Policy Literature

Descriptions of National and Regional Sport Federations/Associations CEPs

Implementation plans and protocols. Three studies described the development process and protocols for implementing small-scale CEPs: Donaldson & Poulos⁸⁰; Ntoumanis et al.⁹⁴; and Turnnidge & Côté.⁹⁸ **Common principles** were highlighted when planning the implementation of a CEP: (a) identify potential program adopters and implementers (knowing the audience), and (b) select theory-informed methods and practical applications to enhance program adoption and implementation (create sport-specific content). **Other principles presented:** (c) state program utilisation outcomes and specify adoption and implementation performance objectives; (d) specify determinants of program adoption and implementation; (e) create matrices of change objectives for program adoption and implementation; (f) design interventions for program adoption and implementation; (g) evaluating effectiveness of the CEP. **Delivery models of the workshops:** 1 to 2-day workshops, designed with various interactive and reflective activities, such as role-playing

activities, use of videos, reflective questions, partner-based activities, etc. The studies also included follow-up activities as a formative evaluation.

Implementation descriptions. The contexts included: (a) large-scale CEPs, and (b) university-based CEPs. Between the large-scale CEPs the most common delivery model was in-person, through camps and workshops, with just a few CEPs provide online training. Some CEPs also required that coaches complete several hours of “ongoing coaching practice” throughout the program. The CEPs lasted from 10 to 36 months, and the university-based programs lasted four years on average - (a) the total of hours for the program is 3,200, (b) the hours for common core/fundamental courses is 825, (c) the hours for coaching/sport specific courses is 900 (R = 320–1010), (d) the hours for internships in sport is 150, and (e) the hours for cultural-scientific-academic activities is 240. Most of the large-scale CEPs provide 4 levels of accreditation. The form of assessment varied widely between the programs (e.g., portfolio, projects and written exams, and practical training assessment). Although, some CEPs did not provide descriptions of assessment/evaluations. Time constraints was one of the challenges faced by the large-scale CEPs. The countries in which the CEPs did not have evaluations included Denmark, Brazil, France, Germany, Netherlands, Norway, Switzerland, New Zealand, Australia, Ireland, New Zealand, Singapore, Hong Kong, Hungary, and the United States of America.

Policy Accreditation of International Sport Federations

The 35 federations responsible for all official Summer (28 federations) and Winter (7 federations) Olympics Sports were investigated. None of the seven Winter Sports Federations provide policy accreditation descriptions. Among the 28 Summer Sports Federations, 18 provide certification descriptions, while 10 do not describe their programs. The most common delivery model is in-person (32.14%), followed by in-person + online (28.57%). None of these federations provide only online courses. Most of the federations that provided policy descriptions have three (44.83%) or four (24.13%) levels of certification. The duration of the course/program at each level ranges widely (see Table 4 for more details).

Table 4: Policy accreditation of Summer Sports Federations

Delivery model	#	%
In-person	9	32.14
Online	0	0
Both	8	28.57
Unspecified	11	39.29
Certification levels¹	#	%
Level 1	2	6.90
Level 2	2	6.90
Level 3	13	44.83
Level 4	7	24.13
Unspecified	5	17.24

¹ There is 29 in total instead of 28 because FIVB has different levels for volleyball and beach volleyball.

Course duration in each level	Minimum	Maximum
Level 1	5-day / 24- hour	9-week
Level 2	5-day / 30-hour	17-week
Level 3	5-day / 34-hour	12 to 18-month
Level 4	144-hour	1-year pre-course + 6-day course

Policy Accreditation of National Governing Bodies/ Sport Federations / Olympic Committees

*Botswana (Southern Africa).*⁹⁷ Botswana does not have a national coaching certification program. The Botswana National Olympic Committee developed the Botswana Long Term Coach Development model, recognizing three coaching specialization areas: (a) grassroots/ primary school: develop fundamental movement and sport skills through fun, simple activities; (b) youth/secondary school: consolidate skills leading to the competitive experience and identify potential talent; (c) senior/post-secondary school: fine tune skills and aim for excellence through periodized elite training. There are no academic requirements for any of the coaching specialties.

All three have four initial training levels:

- Level 1: two-week course 1 + exam
- Level 2: mentorship + portfolio (training plans, schedules, performance, number of athletes, and any crucial information that enhances coaching knowledge)
- Level 3: course 2 + exam
- Level 4: practical + portfolio

All coaches in Botswana are primarily volunteers, except for a few football (soccer) and track coaches.

*Ice hockey in Russia (Transcontinental country - Europe and Asia).*⁷³ According to the regulations of the Ministry of Labour and Social Development of the Russian Federation (2014)¹⁴⁸, every individual who wants to become a coach in a particular sport must have a Bachelor Degree in Sports Science from an accredited college or university with an emphasis in the sport they intend to coach. The governing body that is responsible for the development of ice hockey in the country is the Russian Ice Hockey Federation. The accreditation system encompasses four levels:

- License D: recreational and youth levels; no practical coaching experience required.
- License C: higher levels; sports schools that compete at the regional and national levels. Coaching staff require at least one year of experience.
- License B: highest levels – professional leagues; Candidates must have at least three years as a member of a coaching staff.
- License A: top-level – permit for a coach to work at any level, including the possibility of working with national teams. Candidates must have at least three years as a member of a coaching staff.

Licenses are valid for four years, upon which time the coach must reapply to the coaching school to renew the same license to be considered for promotion to the next level. The requirements for the C and D level licenses are that the applicant must hold a degree from a sports school or a Baccalaureate Degree from a university. The only education that is acceptable at the A and B levels is a Baccalaureate Degree in any field from a university.

*Ireland (Europe).*⁷⁶ The island of Ireland represents a unique setting as it comprises a hybrid jurisdiction of (a) the United Kingdom and Northern Ireland and (b) the Republic of Ireland. Both systems use a "4 by 4 Coach Development model" (children's coach, participation coach, performance/talent coach, and high-performance coach). In terms of national recognition, the United Kingdom Coaching Certificate (UKCC) is accredited by the Qualifications and Credit Framework, whereas the Coach Development Program for Ireland (CDPI) is currently in the process of achieving recognized qualification status in the National Framework for Qualifications in Ireland.

- UKCC: generally, coaching qualifications begin at Level 1 and go up to Level 4.
- CDPI: Aligned with athlete development - Introduction Level (fundamentals), Level 1 (learning to train), Level 2 (training to train), Level 3 (training to compete), and Level 4 (training to win).

*Football in Ireland (Europe).*⁹⁵ The Irish Football Association (IFA) governs Northern Ireland while the Football Association of Ireland (FAI) governs the Republic of Ireland in the south. The FAI Coach Education pathway 2017-2020 includes four licenses. A child welfare course and garda (i.e., police) vetting is mandatory for all coach education participants.

FIA licenses:

- Grassroots football: Kick Start 1 and Kick Start 2;
- Adult football: National License D and C, UEFA-B (minimum of 120 hours), UEFA-A (minimum of 180 hours), UEFA-A elite youth (minimum of 80 hours), combined UEFA-A and elite youth (minimum of 260 hours), UEFA-PRO (minimum of 360 hours);
- Futsal: Licenses D and C, UEFA-B (minimum of 120 hours);
- Goalkeeper: Licenses D, C, and B, UEFA A GK (minimum of 120 hours).

Coaching practice evaluation: Individual coaching; make corrections at a natural stoppage: (i.e., free kicks, ball going out of bounds, injury, etc.); Manipulation of the activity: using a conditioned game or practice that participants can coach; video analysis; freeze: stopping the session to paint a picture; self- education: style, philosophy, set pieces, game understanding.

*Football in Brazil.*⁸⁷ Coach certification is offered by the Brazilian Football Confederation (CBF). Unlike other sports in this country, a Physical Education diploma is not required by law to become a football coach in Brazil. There are four levels with the following scheme:

- Level Pro: Excellence in Football 320h - 240h course, 50h of monitoring and 30h of assignments and evaluations.
- License A: Professional Football 210h - 140h of course, 40h of monitoring and 30h of assignments and evaluations. The aim is to qualify the professional who works or wants to work in football, in professional teams, as a coach, for a competent and scientifically updated practice, based on ethical and scientific bases. Physical Education Professionals who have License B certification; Former athletes who have License B certification; Professional team coaches with at least 5 years of proven experience.
- License B: Training of athletes 180h - 120h course, 30h of monitoring and 20h of assignments and assessments. The aim is to qualify the professional who works or wants to work in football, in teams of basic categories, as a coach, for a competent and scientifically updated professional practice, based on ethical and scientific bases. Target audience and prerequisites: Football Coach Qualification Certificate C CBF license; Complete high school and proven experience of at least 3 years as a grassroots trainer (C CBF License leveling course required); Complete high school and have been a professional soccer athlete for at least 5 years (required to take License C leveling course).

Scoping Review of Literature on Sport Coach Education Programs

- License C: Football development 150h - 90h course, 30h follow-up and 20h of assignments and assessments. Target audience and prerequisites: Physical Education Professionals (Bachelor or Bachelor); Physical Education students attending the last year (senior students); Former professional soccer athletes, complete high school and 5 years of proven career; Coaches / teachers of high school football schools with at least 5 years of proven experience.

*Finland (Europe).*⁸³ The Finnish Olympic Committee coordinates the network for all those organizations that develop coaches. The networks include Sport Federations, District Organizations, Sport Institutes, Universities, Coaches Associations, Sport Academies, the Research Institute for Olympic Sports, Expert Networks, and the Finnish Sport Federation.

- Aims and values for Finnish Sports and Coach Development: Athlete Centeredness; Athlete Pathway (childhood, choice, and peak phase); Continuous Development and Cooperation.
- Coach Education Pathways in Finland (three streams): a) sport federations education programs (competency-based); b) Vocational coach education program; c) higher education programs. Coaches can combine the streams and choose their education path in many ways.
- Sport federations: There is a national framework (VOK), which is flexible for sport specific needs. The VOK-framework has three levels (competency-based):
 - Level 1 provides competences a coach needs for delivering a single training session.
 - Level 2 describes competences for planning, delivering and evaluating a training season or training year.
 - Level 3 includes competences for longer term planning and guiding an athlete across an entire athletic career.
- The vocational education: Sport assistant, vocational qualification in coaching, specialist vocational qualification in coaching.
- Higher Education: Bachelor, Masters and Doctoral degrees.

*Gymnastic in USA (North America).*¹⁰¹ Women's junior Olympic coaches' course certification - to train Junior Olympic athletes Levels 5 – 7 (2011). The course comprised 5 days of practical and classroom instructions. Training included hands-on spotting techniques; proper body shaping; lesson plans and lectures on strength, conditioning, flexibility, periodization, sports medicine, and psychology.

*TopCoach5 program in Netherlands (Europe).*⁹⁹ Coach programs are offered by educational institutes and by federations.

- Secondary education: Level 1. Sport sector: federations.
- Vocational education: Levels 2, 3 and 4. Sport sector: federations.
- Higher education: Level 5. Sport sector: top coach.

The TopCoach5 program is the highest coach program in the Netherlands and it is a unique partnership between two universities of applied sciences and Netherlands Olympic Committee/National Sports Federation. It is a competency-based program (sets of knowledge, skills, attitudes and personal characteristics). Multiple sports. The program is based on professional practice. The program consists of 2100 hours.

- Knowledge: to develop the concepts, the vision and the approach of the trainee coaches. Two-day meetings.
- Skills: The student works in practice; supervision by one or more experienced coaches.

Scoping Review of Literature on Sport Coach Education Programs

- Attitudes: The skills that the trainees work on range from “learning to hold interviews” and “using the video analysis program” to “carrying out the Snatch as a form of strength exercise”.
- Personal Characteristics: The student chooses his or her own learning coach, a person with sport background who does not have a connection to the student’s specific sport. The learning coach is the only expert to remain linked to the student throughout the entire 8 to 24-month process.
- Assessment: A competence-test. Each student indicates the point at which he or she wants to be assessed.

Track and Field in Australia (Oceania).^{72,88-93} The Australian Track and Field Coaches Association initiated the Coach Accreditation Scheme in 1974. The courses conducted are largely practical with emphasis on the better organisation of practices, appropriate methods of skill learning and development, correction of technique, appropriate conditioning methods, and performance analysis. We gathered information of the CEPs from 2009 to 2016. In 2016, the levels ranged from Novice to National Level 5 with the following scheme:

- Introduction to coaching course: For people who have little or no experience and coach young athletes (5-15y); 8-hour course
- Level I: 16-hour course over a two-day period designed for novice coaches (not the beginning course); a multiple-choice exam at the completion of the course
- Level II - specific event group coach: 14-hour course over a two-day face-to-face training;
- pre and post course assessments. An exam given to participants at the completion of the course
- Level III, IV and V: unspecified – under review
- Reaccreditation: Level I and II: Automatic, as coaches receive publications from the association.
- Reaccreditation: Level III, IV and V: Coaches outline their coaching involvement and itemize any courses, seminars or workshops attended, as well the achievements of their athletes.

Policy Accreditation of Portuguese and Spanish-Speaking Countries

*Angola (South-Central Africa).*¹⁰⁶⁻¹⁰⁸ Angola is a Portuguese-speaking African country. Article 33 from the "Law of Sport" (1998) defines that the exercise of teaching technical activities in the field of sport (coaching) is conditional on the possession of adequate qualifications, and a certain frequency in attending certification programs. However, there is no indication of any type of certification program or what kind of qualifications are necessary for sports coaching. Physical Education is an area of knowledge in higher education, so it is assumed that it gives conditions and access to the technical orientation of sports activity. There is no national or Olympic coach education system. Olympic Solidarity offers different programs for Angolan coaches. The application information is posted at the Olympic committee for coaches' and also, for sports managers. As an example, the 2019 applications are open for the International Coaching Enrichment Certificate Program, organized by the American Olympic Committee and also the General Course of Applied Sports Science, offered by the University of Barcelona (COA, 2019). In addition to these coach education possibilities, we also found individual initiatives for specific sports. For example, a training program for Football coaches

promoted by the Angola Football Academy (AFA, 2015) and also, a training program for athletics coaches, promoted by International Athletics Federation (FAA, 2018).

Argentina (South America).^{109,110} According to the Sports Law (27202/2015) “coaches should have qualifications recognized by the Ministry of Education or the civil associations of second degree or superior entities of sport. ” The superior entities of sports are sports federations and national schools of coaches. Coach Education in Argentina, fundamentally, occurs through programs offered by national sports federations and national schools of coaches. There is no national accreditation program or Olympic academy. These coach education programs are divided from 1 to 4 levels of expertise in a traditional perspective (from 1- grassroots to 4- high performance). Pre-requisites for participating in the certification programs are reaching 18 years old and completing secondary school. The programs are offered via online strategies; and face to face, including practical sessions and internships. The workload varies according to the level and sport.

Brazil (South America).^{87,111-113} Coaching is recognized as a profession in Brazil and the coach education trajectory combines initial training and continuous training through different contexts, such as universities, federations, and the Brazilian Olympic Committee (BOC). Coaching in Brazil has been formally recognized as a profession since 1998. Accordingly, coaches need to hold a bachelor’s degree in physical education to have their professional license to work in any sport context (Brazil, 1998). In 2016, there were 528 regular physical education bachelor programs from public to private universities (Ministry of Education, 2016). Undergraduate programs in Brazil have been analyzed to understand how coaches are prepared. Milistetd, Trudel, Mesquita and Nascimento (2014) investigated physical education bachelor programs in federal universities in Brazil. They found that of 3,200 hours out of these programs only 1/5 of the program’s workload focused on general notions about sport. For the most part, programs focused on sport-specific content such as teaching technical and tactical skills (e.g., in swimming, soccer, volleyball). For continuing training, coaches have the opportunity to engage in certification programs offered by sports federations and Brazilian Olympic Committee (BOC).

Milistetd et al.¹¹² showed that from 30 Olympic sports federations, 12 offered certification programs regularly: track and field, badminton, canoeing, soccer, wrestling, rugby, diving, tennis, table tennis, triathlon, volleyball, and beach volleyball. Each sport federation has different levels of coaching that vary and, in some cases, coaches need to attend such courses to coach specific teams at different competitive levels. Each federation includes up to five certification levels, and course lengths vary from 40 – 850 hours. Each certification level is still designed in a traditional view in which levels are defined according to the competitive context in which coaches will be intervening (e.g., Level 1, under-14 years of age; Level 2, under-18 years of age). Course content is focused on specific sports knowledge (techniques, tactics, physical preparation, training methods).

Another opportunity for coaches is to participate at the Brazilian Coaches’ Academy (BCA). BCA was created by the Brazilian Olympic committee to support high performance coach development, especially those involved in sports whose there are no Sports Federation certification programs, or sports considered likely to win Olympic medals. To date, 360 coaches have participated in the academy in different sports such as track and field, swimming, cycling, martial arts, rowing, gymnastics, and canoeing (Brazilian Basketball Confederation¹¹³). The program is separated into two modules: Development athletes; and Performance athletes. The modules require around 400 hours to

complete and are organized into different courses, similar to an undergraduate program (Milistetd et al.¹¹²). Although the BCA is considered a valuable learning opportunity for high performance coaches, the theoretical orientation of the program is a strong limitation to developing highly experienced and effective coaches.

Portugal (Europe).^{96,104,105} Following the guidelines stated by the Aligning a European Higher Education Structure in Sport Science (AEHESIS, 2006) and the European Network of Sport Sciences in Higher Education (ENSSHE), a new vision of the sport coaching profession was established in Portugal. Complying with the EU directives, the process of coach education, in terms of technical and scientific expertise, and also in terms of organizational and management skills, has been increasingly valued in Portugal. Thus, since 2008 access to and provision of sports coaching activity was limited to coaches who earned a coach certificate (Cédula de Treinador Desportivo — CDT; IDP, 2010). The national government now regulates access to education and training, curriculum, the level of teachers, monitoring, funding and licensing. The government also delivers financial support to education providers, clubs, and participants based on direct costs of coach education and the number of participants. Coach education qualifications are part of a qualification framework based on learning outcomes.

The sport framework is based on occupational and professional profiles developed with branch organizations, employers and employees in the sport sectors. The implementation of the learning outcome approach is not limited to the description of the qualification frameworks developed. It also includes methods of assessments, the curriculum, validation mechanisms and freedom to develop individual pathways. In 2012, a new law was created to regulate coach education. It was determined that the stages of practitioner development is an important element for the definition of coaching skills required to train athletes at different levels of development. All sports federations must now provide a framework that links athlete development to coach grades (levels). There are four coach education grades. The coach education courses have a vertical layout in line with the increasing performance of athletes, revealing an education continuum that evolves from grade one through to grade four. This development is noticeable in the form of increased complexity of the coaching content as well as in the number of hours required to complete each grade. Although the coach education system varies depending on the practitioner context (sport, and developmental stage of athletes), the coach education framework reflects a linear and hierarchal organization of coaching levels assuming a sequence from entry stages to high performance. This association between coach education and athlete's competition level places inexperienced coaches in the early stages of athlete development (Resende et al.⁹⁶). According to the national legislation there are 4 venues to get the professional certification: (a) technical and vocational training (promoted by institutions certified by National Sports Institute); b) Academic training (Sports Sciences and Physical Education, Master and PhD Levels); Recognition of competences (Ex. Ex-athletes); and d) Recognition of certifications obtained abroad. In a cycle of years certified coaches should engage in a number of formal programs to keep their licenses. So, educational institutes, sports federations, and sports associations regularly promote conferences, workshops, and clinics for coaches.

Spain (Europe).^{102,103} Development of sport coaches in Spain are based substantially on Royal Decreto 1363/2007 and Orden EDU 3186/2010. Royal Decreto 1363/2007 defines the minimum conditions and content for the training of coaches. Although it has been adapted as part of the national laws on vocational training, sanctioned since 1998, some sports (Athletics, Basketball,

Handball, Football and Indoor soccer) and winter and adventure sports are still governed by the 1997 law. The other sports are in line with the new legislation. On the other hand, Order EDU 3186/2010 regulates the curricular aspects, the authorization procedures, and the training activities. In this way, minimum workloads are defined for all sports in a theoretical and practical manner, as are: access requirements, training objectives, skills to be developed, internships, evaluations, and validation of titles for each of the different levels.

The official documents also define the career of Spanish coaches in two main titles, with different characteristics, needs, and requirements. The first is called Sports Technician (Coach) and among the requirements to start training are the minimum age of 18, the completion of high school diploma, and in some cases master specific requirements in one sport or experience as an athlete. The second title of Senior Sport Technician (Senior Coach) is established for holders of the first level title and at least 20 years of age, as well as demonstrating a minimum level of competencies as required by the specific tests of each federation.

Coach training courses, which are governed by current laws, are organized in 3 separate levels. The first level refers to obtaining the title of sports coach, which includes skills to work with grassroots sports programs. Levels 2 and 3 refer to the achievement of the title of Senior Coach, involving competences for structured training for youth and adults, and high-performance training, respectively. While the minimum workload set for the first level is 250 hours, for the second level it is 465 hours, and for the third level, 210 hours. The training structure is divided into two stages, initially intended to acquire knowledge and skills common to all sports and, later, the specific knowledge of each sport.

The sports federations are responsible for the specific training, where each of them organizes its own courses. These courses are offered periodically and are divided into theoretical and practical modules, having a minimum common load for each of them. The body of common knowledge, which precedes entrance into the federation courses, is offered by national vocational training centres and comprises a set of technical and scientific knowledge that serves as a basis for furthering in sports specialties. The professionals of Physical Education can request the use of their subjects studied in the initial formation, beyond the common block of knowledge. High-performance athletes are also covered by Royal Decree 1363/2007, and may meet certain requirements and specific knowledge throughout their training.

Conclusions

This review helped to generate a greater understanding of the design, delivery, and effectiveness of CEPs across multiple countries globally. The search, screening, and selection process was systematic yet inclusive in nature, and helped to amalgamate literature across the diverse domain of sport coaching. The extracted data from the selected studies help to offer an outline of what each CEP looks like and to what extent were these CEPs effective in their intentions. The quantitative data analyses helped to examine of the nature/makeup of the contexts and participants that were involved in the CEPs, the design of the CEPs, and the methodologies and methods used to evaluate these CEPs. The qualitative procedures helped to generate understandings about the results of these studies in relation to implementation, process, and outcome factors. The descriptions of

policy literature helped to offer more context to the nature of some of the CEPs in these studies, and the interpretations of the CEP evaluation results.

The results showed how the selected CEPs were often specific to a sport context, level of competition, and age of athletes in the context; however a significant portion of these CEPs were also general, non-specific to a particular context, sport, or age of athletes. This may be tied to the finding of how a common challenge of learning was the non-specificity of CEP content, which deterred relatability and practical means of applying content to practice. Suggested in some studies was to transition from one-size-fits-all approaches to more context-specific practices that incorporate practical opportunities such as active rather than passive learning, problem-based learning, reflection, peer learning and interaction, ongoing feedback and social support, and communities of practice. Many of the CEPs were similar in the processes that influence learning and behaviour change of their participants, and these findings are similar to existing reviews that evaluated Canadian and UK-related CEPs (Lyle, 2007).

Funding

This project was funded by the Coaching Association of Canada (CAC; <https://www.coach.ca>).

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Note: Articles in this reference list do NOT include the selected articles. These can be found in [Appendix B](#).

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Appendix A: Search Strategy

Searches performed April 30th, 2019

Search Strategy in SportDiscus (EbscoHost)

#	Query	Limiters/Expanders	Results
S1	(DE "COACHES (Athletics)" OR DE "AFRICAN American coaches (Athletics)" OR DE "ASSISTANT coaches (Athletics)" OR DE "BASEBALL coaches" OR DE "BASKETBALL coaches" OR DE "BOXING trainers" OR DE "CATHOLIC coaches" OR DE "COLLEGE athletic coaches" OR DE "CRICKET coaches" OR DE "DIVING coaches" OR DE "FENCING coaches" OR DE "FOOTBALL coaches" OR DE "GAY coaches (Athletics)" OR DE "GOLF coaches" OR DE "GYMNASTICS coaches" OR DE "HOCKEY coaches" OR DE "HURLING coaches" OR DE "ICE dancing coaches" OR DE "LACROSSE coaches" OR DE "LGBT coaches (Athletics)" OR DE "ROWING coaches" OR DE "RUGBY football coaches" OR DE "SKATING coaches" OR DE "SKI coaches" OR DE "SOCCER coaches" OR DE "SPRINGBOARD diving coaches" OR DE "SWIMMING coaches" OR DE "TENNIS coaches" OR DE "TRACK & field coaches" OR DE "VOLLEYBALL coaches" OR DE "WATER polo coaches" OR DE "WOMEN coaches (Athletics)" OR DE "WRESTLING coaches") AND (DE "EDUCATION" OR DE "CONTINUING education")	Search modes - Boolean/Phrase	206
S2	DE "EDUCATION of athletic coaches" OR DE "TRAINING of athletic coaches"	Search modes - Boolean/Phrase	427
S3	TI ((coach*) N3 (educat* or develop* or training)) OR AB ((coach*) N3 (educat* or develop* or training))	Search modes - Boolean/Phrase	6,834
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	7,061
S5	DE "EDUCATIONAL programs" OR DE "EDUCATIONAL intervention" OR DE "CERTIFICATION"	Search modes - Boolean/Phrase	6,338
S6	TI (certifi* or workshop* or program* or curricul* or instruct* or ((education* or learn*) N2 (material* or interven*)) or policy or policies) OR AB (certifi* or workshop* or program* or curricul* or instruct* or ((education* or learn*) N2 (material* or interven*)) or policy or policies)	Search modes - Boolean/Phrase	194,027
S7	S5 OR S6	Search modes - Boolean/Phrase	196,571
S8	S4 AND S7	Search modes - Boolean/Phrase	2,439

S9	S4 AND S7	Limiters - Published Date: 20100101- 20191231 Narrow by Language: - multiple languages Narrow by Language: - portuguese Narrow by Language: - spanish Narrow by Language: - chinese Narrow by Language: - english Search modes - Boolean/Phrase	1,081
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Limits applied: Pub. years: 2010-current; Languages: French, English, Portuguese, Spanish, Chinese.

Results: **1,081** references retrieved

Sports Medicine & Education Index (formally: Physical Education Index) (Proquest)

((ti(((coach*) NEAR/3 (educat* OR develop* OR training))) OR ab(((coach*) NEAR/3 (educat* OR develop* OR training)))) OR (subject("Education") AND (subject("Coaches") OR subject("Coaches & managers")))) AND (ti((certifi* OR workshop* OR program* OR curricul* OR instruct* OR ((education* OR learn*) NEAR/2 (material* OR interven*)) OR policy OR policies)) OR ab((certifi* OR workshop* OR program* OR curricul* OR instruct* OR ((education* OR learn*) NEAR/2 (material* OR interven*)) OR policy OR policies))) AND (la.exact("ENG" OR "CHI" OR "FRE" OR "POR") AND pd(20100101-20191231))

Results: **818** references retrieved

Medline (Ovid)

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <1946 to April 25, 2019> Search Strategy:

-
- 1 (coach* adj3 (education* or development* or training)).ti,ab,kw. (1044)
 - 2 Certification/ or exp policy/ (164207)
 - 3 program development/ or Program Evaluation/ (78527)
 - 4 curriculum/ (70899)
 - 5 (certifi* or workshop* or program* or curricul* or instruct* or ((education* or learn*) adj2 (material* or interven*)) or policy or policies).ti,ab,kw. (1161827)
 - 6 2 or 3 or 4 or 5 (1313216)

Scoping Review of Literature on Sport Coach Education Programs

- 7 1 and 6 (528)
- 8 limit 7 to yr="2009 -Current" (440)
- 9 limit 8 to (chinese or english or french or multilingual or portuguese or spanish) (436)

Results: **436** references retrieved

Embase (Ovid)

1. (coach* adj3 (education* or development* or training)).ti,ab,kw.
2. certification/
3. exp policy/
4. education program/
5. program development/ or exp program evaluation/
6. workshop/
7. curriculum/ or curriculum development/
8. (certifi* or workshop* or program* or curricul* or instruct* or ((education* or learn*) adj2 (material* or interven*)) or policy or policies).ti,ab,kw.
9. 2 or 3 or 4 or 5 or 6 or 7 or 8
10. 1 and 9
11. limit 10 to yr="2010 -Current"
12. limit 11 to (chinese or english or french or portuguese or spanish)

Results: **581** references retrieved

PsycInfo (Ovid)

1. coaches/ or coaching/ or sports coaching/
2. exp education/
3. 1 and 2
4. (coach* adj3 (education* or development* or training)).tw.
5. 3 or 4
6. professional certification/
7. exp policy making/
8. education policy/
9. exp program development/ or exp program evaluation/
10. educational programs/
11. educational program accreditation/
12. curriculum/
13. (certifi* or workshop* or program* or curricul* or instruct* or ((education* or learn*) adj2 (material* or interven*)) or policy or policies).tw.
14. 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15. 5 and 14
16. limit 15 to yr="2010 -Current"
17. limit 16 to (chinese or english or french or portuguese or spanish)

Results: **1041** references retrieved

SciELO Citation Index (Web of Science interface – Clarivate Analytics)

Scoping Review of Literature on Sport Coach Education Programs

TOPIC: (coach* NEAR/3 (education* or development* or training)) AND **TOPIC:** ((certifi* or workshop* or program* or curricul* or instruct* or ((education* or learn*) NEAR/2 (material* or interven*)) or policy or policies).)

Timespan: 2010-2019. **Indexes:** SCIELO.

Results: **24** references retrieved

LILACS

tw:((tw:(coach* AND (educat* OR develop* OR training))) AND (tw:(certifi* OR workshop* OR program* OR curricul* OR instruct* OR "educational material" OR "learning material" OR "educational intervention" OR "learning intervention" OR policy OR policies))) AND (instance:"regional") AND (db:("LILACS") AND year_cluster:("2011" OR "2010" OR "2012" OR "2015" OR "2018" OR "2013" OR "2014" OR "2017"))

Results: **77** references retrieved

Web of Science Core Collection (Clarivate Analytics)

TOPIC: (coach* NEAR/3 (education* or development* or training)) AND **TOPIC:** (certifi* or workshop* or program* or curricul* or instruct* or ((education* or learn*) NEAR/2 (material* or interven*)) or policy or policies)

Refined by: LANGUAGES: (ENGLISH OR PORTUGUESE OR SPANISH OR CHINESE OR FRENCH)

Timespan: 2010-2019. **Indexes:** SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI.

Results: **1409** references retrieved

Appendix B: Bibliography of Selected Records

Evaluation Studies

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Appendix C: Extracted Information from Selected Records

[Included as a separate spreadsheet.](#)

Appendix D: Extracted Information from Policy Records

[Included as a separate spreadsheet.](#)

Appendix E: Flow Diagram

[Included as a separate PDF.](#)