Original Article

Evaluation of an online course in sports: A literature review

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Abstract:
Before the pandemic, online courses were not very common. With changes in the learning system placing participants at the center of learning, online courses became one of the solutions and people's first choice to learn and develop themselves. The purpose of this study is to analyze and evaluate various studies on online courses in the field of sports in various countries. The articles are peer-reviewed and identified through 3 databases indexed by Scopus, Eric, and Sage. The included articles were published from 2018 to 2022; they were selected and extracted using PRISMA Flowcharts. A total of 13 original articles met the criteria for entry into the review (i.e., 3 qualitative, 6 quantitative, and 4 qualitative and quantitative studies) from various countries, namely 5 articles from Canada, 4 articles from the United States, 1 article from Germany, 1 article from China, 1 article from the United Kingdom, and 1 article from Japan. Two studies were published in 2018, three in 2019, one in 2020, three in 2021, and four in 2022. The articles were reviewed, and it was determined that online courses considerably influence the ease with which participants obtain information, identification, and solutions to their needs. online course conducted in the sports field is practical and a solution because coaches in various countries obtain the same information. The obtained results showed no significant difference between in-person and online courses. Online courses are a good best practice in self-development, especially in sports. However, the materials for evaluation have limitation in terms of using English language in some Asian countries. Language is an inhibiting factor for equal access to information.
Keywords: Higher Education, Professional Coach, Online Course, Sports Education

Introduction

The digital era forces everyone to become lifelong learners (Bagnall & Hodge, 2018; Bond et al., 2018; Bonfield et al., 2020) Studying and taking courses does not have to be at the same place. This provides convenience and flexibility to develop oneself (Mahdaria & Restuaji, 2021). The pandemic has made many people aware of health and physical activity as a way to build immunity in the body and as an educational tool to have a longer life expectancy (García Tascón et al., 2020; Kamoga & Varea, 2022; Shahrbanian et al., 2020). Physical activity has been identified as one mechanism that mitigates the negative impact of stress on psychological well-being and functioning (Brand et al., 2019; Ludyga et al., 2020; Sadeghi Bahmani et al., 2020). Physical activity exercises the relationship between job stress and burnout and encourages emotional recovery from stressors. Physical activity and exercise have a significant positive effect on preventing or reducing mental illness, including symptoms of depression and anxiety or stress-related illnesses. Good health requires physical activity carried out with development and continuity (Malm et al., 2019).

Many sports training has been performed online since the pandemic, which requires certified and qualified trainers to become fitness trainers. One area that has seen rapid expansion of use in facilitating and enhancing trainer learning and development is online and technology-enhanced collaborative learning (Cushion & Townsend, 2019).

The demand requires prospective coaches and teachers to have updated and qualified sports science knowledge. This is especially relevant in the online environment, where there has recently been a call for trainers to be more critical in the consumption and sharing of information (Stoszkowski et al., 2020).

Online courses can be used as a support in the use of technology and allow the trainers to continue to learn from various countries and subjects that support the science of sports coaching. With the increasing use of online learning tools and platforms in trainer education and development (i.e. blogs, forums and social networking sites), the number of peer reviewed papers reporting their use continues to increase. Recently, Koning (2020) found that sports coaches perceive the social network Twitter as an invaluable platform for collaborating, accessing information, and sharing ideas and resources with other coaches. Likewise with Musa et al (2021) found that, especially during a worldwide pandemic. Further research conducted by (Sokolovskaia et al., 2022) shows the results that online courses on the psychological aspects of sport and a healthy lifestyle show effective results for forming a conscious attitude towards their physical, somatic, mental health, physical activity, and quality of life.

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Related studies that discuss online courses suggest that there is no difference in effectiveness between online and offline training. However, there are also some drawbacks related to the comparative method, i.e., the limitation of English, especially in Asia; it is more difficult to get the same information as in other countries that use English in their daily life. This study aims to evaluate online courses, especially in the field of sports in order to find the position of researchers and provide inspiration and updates that can be implemented in the long term later.

Materials and methods

Information hotspots for peer-investigated articles were recognized through a few data sets, including Elsevier, Eric, and Sage. An online search was conducted to identify the relevant literature. The keywords used to identify relevant articles are as follows: ("online coaching", "online course in sport", and "online coaching for developing knowledge"). All articles that appear in the search results are listed. This review is limited to articles reporting the findings of original articles published from 2018 to 2022. Studies that do not meet the specified criteria will be screened. Because of the variety of examination techniques, the authors did not restrict studies to explicit plans. Each article is evaluated based on specific rules: (1) the targets and exploration questions are clearly stated; (2) the examples and study population provided, (3) the information assortment strategy is reliable, (4) the basic estimation is satisfactory and substantial, (5) the outcomes can be extensively characterized, (6) the investigation of result is clear and appropriate.

Data extraction

In data extraction, the first stage is the identification process; the author excludes articles that do not discuss online courses in the field of sports in their intervention. A total of 245 non-relevant articles were identified based on their titles using the Elsevier, Eric, and Sage databases. Furthermore, articles that contain duplicates were excluded at a later stage. During the screening stage, 16 articles were found that presented empirical data identified from the title and abstract; 3 were excluded because the article did not discuss the evaluation of online courses for developing sports knowledge. Furthermore, in terms of eligibility, 13 articles were identified that contained adequate methodological information. The 13 original articles included in the review consisted of 3 qualitative studies, 6 quantitative studies, and 4 qualitative and quantitative studies. Data extraction and identification strategy used PRISMA Flowcharts.
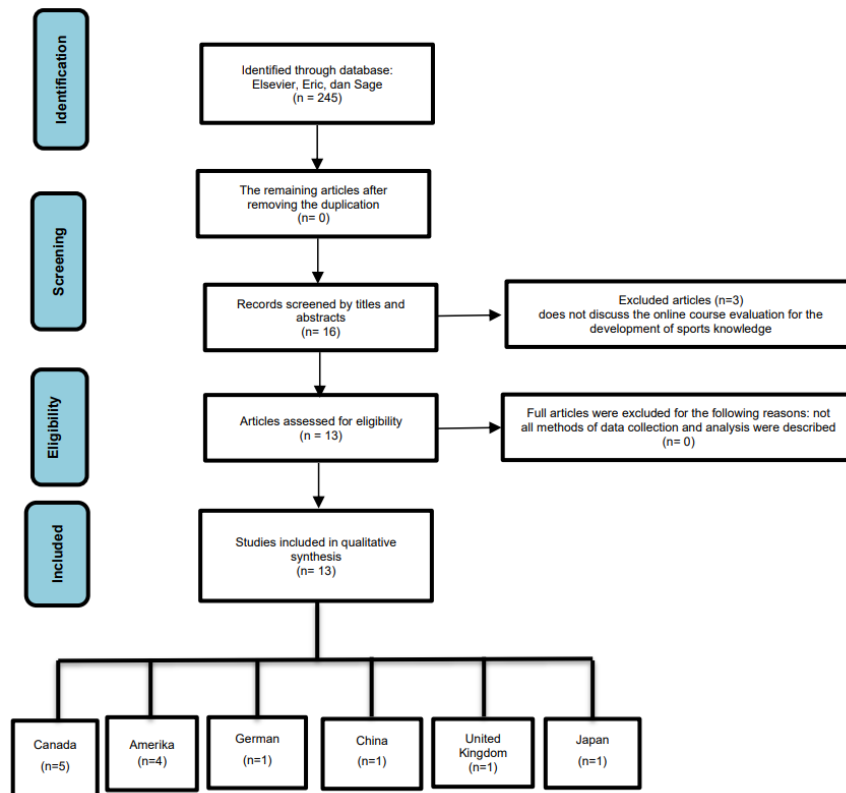
Results

After deleting unqualified articles, 13 studies met the research criteria in terms of the appropriate research variables and methods. The PRISMA flowchart is shown in Figure 1. The most common reason for the exclusion of an article is because it does not discuss an online course in sports and the sample does not include trainers. A summary of each study is provided in Table 1. The included research articles are from the following

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countries: Canada (n = 5), United States (n = 4), Germany (n = 1), China (n = 1), United Kingdom (n = 1), and Japan (n = 1). The articles included in this study were published from 2018 to 2022 and presented novel results. Two studies were published in 2018, three in 2019, one in 2020, three in 2021, and four in 2022. Most studies were published in credible international journals indexed by Scopus, MEDLINE, and PubMed.

Table 1. Operationalization and Statistical Analysis of the Reviewed Articles

Author and Year	Year of Publication	Country of Study	Journal	Index	Publisher	Study Method	Data Collection Method	Respondent Selection Method	Statistical Analysis
(Farhat et al., 2022)	2022	Canada	International Journal of Sports Science & Coaching	MEDLINE and PubMed	SAGE Publications	Qualitative and quantitative	Semi-structured interviews and Google Analytics	Selection-based	Inductive and thematic analysis
(Rittenberg et al., 2022)	2022	Canada	International Journal of Sports Science & Coaching 2022, Vol. 17(4) 713–721	MEDLINE and PubMed	SAGE Publications	Cross-sectional	Online survey	Selection-based	SPSS v.26 for Mac.
(Song, 2021)	2021	United States of America	International Journal of Electrical Engineering & Education	MEDLINE and PubMed	SAGE Publications	Qualitative	Self-administered questionnaire	Random sampling	An iterative, recursive algorithm
(Weissman et al., 2022).	2022	Canada	International Journal of Sports Science & Coaching	MEDLINE and PubMed	SAGE Publications	Qualitative and quantitative	Self-administered questionnaire and interview	Random sampling	Cohen's kappa statistics and a prevalence-adjusted and bias-adjusted kappa statistics (PABAK)
(Turgeon et al., 2021)	2021	Canada	International Journal of Sports Science & Coaching	MEDLINE and PubMed	SAGE Publications	Quantitative	Online survey	Total sampling	Independent sample t-test
(Camiré et al., 2020)	2020	Canada	Psychology of Sport & Exercise 48 (2020)	Scopus	Elsevier	Quantitative	Survey	Random sampling	Prior to conducting the primary analyses, descriptive statistics were inspected, and transformations were performed using SPSS 25
(Kjær, 2019)	2019	USA	Journal of Hospitality, Leisure, Sport & Tourism Education	Scopus	Elsevier	Qualitative	A site visit and an interview.	Selected based	Thematic analysis
(Geurin, 2021)	2021	United Kingdom	Communication & Sport	MEDLINE and PubMed	SAGE Publications	Qualitative and quantitative	Online survey and interview by phone or skype	Selected based	SPSS 19 statistics and thematic analysis
(Sarmiento et al., 2019)	2019	United States	Journal of Safety Research	Scopus	Elsevier	Quantitative	Self-administered questionnaire	Selected based	SAS version 9.3 statistics, and comparison test of proportions in SPSS version 24 with Bonferroni correction.

(Hülsmann et al., 2018)	2018	German	Computer Graphics and Geometry Processing	Scopus	Elsevier	Qualitative	Interview	Random sampling	Wilcoxon signed the rating test with Bonferroni correction.
(He et al., 2018)	2018	China	International Journal of Sports Science & Coaching 2018, Vol. 13(4) 496–507	MEDLINE and PubMed	SAGE publication	Qualitative and quantitative	Semi-structured interview & interpretation of questionnaire data	Purposive sampling	Thematic analysis
(Daugherty et al., 2019)	2019	USA	Health Education Journal 2019, Vol. 78(7) 784–797	MEDLINE and PubMed	SAGE publication	Quantitative	Pre-test post-test online	Total sampling	Wilcoxon Signed Rank Test Z-scores and effect sizes were interpreted.
(Oishi et al., 2022)	2022	Japan	International Journal of Educational Reform	MEDLINE and PubMed	SAGE publication	Qualitative descriptive	Online oral and written interview	Selected based	Constant comparative analysis

Six studies used quantitative methods by conducting surveys (n = 3), filling out questionnaires (n = 2), and pre- and post-tests (n = 1). Other studies (n = 3) used qualitative methods by conducting interviews and qualitative and quantitative methods (n = 4) by conducting interviews and filling out questionnaires. Regarding the number of reviewed populace, few examples were acquired (Oishi et al., 2022). The abovementioned study interviewed 5 graduate students enrolled in international development and peace program through graduate sports programs in Japan. In addition, online coaching evaluations in sports in Canada were analyzed among 438 coaches from various sports (Farhat et al., 2022) (Rittenberg et al., 2022) (Turgeon et al., 2021) (Camiré et al., 2020) and studied by (Weissman et al., 2022) evaluating 37 students who applied lifestyle-based grassroots sports programs to improve physical literacy. In the United States, as many as 355,156 coaches and 2000 athletes apply online coaching in all sports (Song, 2021; Kjær, 2019 ;Sarmiento et al., 2019) (Daugherty et al., 2019)Meanwhile, a study by (Geurin, 2021) studied a population of 79 people who implemented online training courses in sports on social media. On the other hand, Felix Hülsmann et al. studied a population of 74 trainers in Germany who proposed the use of sports training rehabilitation exercises. (He et al., 2018) conducted an online coaching evaluation in rhythmic gymnastics in China with 176 trainers.

Table 2. Findings of the Reviewed Articles

Author and Year	Total Respondents	Age Range	Area of Study Location	Occupation	Sport Type	Intervention	Research Purpose	Research Findings
(Farhat et al., 2022)	2 girls and 6 boys	>18 years old	Canada	Trainer	Sports psychology	Website	The reason for the current review was to research mentors' insights and utilization of the sport psychology for coaches.ca website. The design was to utilize the data given by the mentors to educate present and future engineers about site access and convenience.	Mentors view the site as a dependable source that offers pragmatic data (worksheets) that can be utilized with competitors and is seen as simple to explore and get data. This study confirms the worth of online assets in giving mentors casual and proof-based sports education information.
(Rittenberg et al., 2022)	83	21–78 years old	online (67 Canada, 6 USA, 8 others)	Professional golfers association golf coaches and instructor	Golf	Sports training technology	The motivation behind this study was to evaluate the training experience and instructing procedure. Adequacy freely anticipated the utilization of	The game of golf is an innovative climate that may restrict the generalizability of our outcomes. While golf is a great stage to

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				s				innovation by golf trainers in the games preparing set.	acquaint these ideas with the literature, it is crucial to note that these outcomes may not matter to all mentors or sports, especially in sports or wearing conditions where innovation is restricted or out of reach.
(Song, 2021)	2000	-	USA	Athlete	Football	Image processing technology (website)	This study aims use the Image processing technology in American football training to deepen the knowledge of athletes.	The application of Image processing technology produces or simulates the optimal level and state in the competitive ability of athletes. It makes it easier for athletes to analyze and solve problems, increase their knowledge, increase their flexibility of practical application, and improve their innovation ability.
(Weissman et al., 2022)	37	Age 7 years – 18 years	Toronto	Student	Physical literacy	Lifestyle-based grassroots sport programs training app	Implementing the BCTTv1 application for children and adolescents to gain an in-depth understanding of active coaching, which is used to improve sports knowledge, motivation, enjoyment and physical literacy (i.e., movement competence, motivation, positive influence, and social participation) among children.	The application (BCTTv1) in this context is most relevant for developing physical literacy among children of various abilities. This study promotes reflective and flexible practice in coaching.
(Turgeon et al., 2021)	36 males, 27 females	44.38 years of age	Canadian high school coaches	Trainer	All sports	Coaching for Life Skills (CLS) online training program	Preparation of follow-up assessments, looking at long haul changes in mentor competitor connections, mentor relational way of behaving, and improving fundamental abilities of mentors who complete the Instructing for Fundamental abilities (CLS) web-based preparation program	No significant difference in scores was observed in training fundamental abilities from benchmark to follow-up to the accompanying season. The outcomes propose that the mediation might have assisted the CLS with gathering mentors and staying reliable in utilizing social training ways of behaving.
(Camiré et al., 2020)	In total, 285 (males = 170, 59.7%) high school coaches from Alberta (53.4%),	Average 42.2 years of age	Canada's National Coaching	Coach	All sports	Coaching for life skills program (CLS)	Assess the adequacy of the Training for Fundamental abilities web-based preparation program in assisting mentors with establishing a climate that is helpful for	Although not critical, the outcomes show a positive directional change in mentors' impression of mentor competitor connections,

	British Columbia (37.5%) and Newfoundland Labrador (9.1%)						educating fundamental abilities.	relational way of behaving, and instructing of fundamental abilities using the developed system.
(Kjær, 2019)	76	-	Join w. NSCAA USA	Coach	Soccer	Website	To investigate the educational plan and conveyance of materials for the alumni of soccer training schooling programs in the US to expand the professionalism of sports instruction.	The program has effectively developed a local area of training that upgrades learning and allows long-term coach improvement. The program makes new information pertinent to understudies in a particular training setting, which has been previously difficult to achieve in college training programs.
(Geurin, 2021)	59	-	London	National Governing Bodies (NGB) communications employees and athletes	Summer and Winter Olympic Sports	Social media training and resources	The aims of this study are twofold: first, to foster a comprehension of virtual entertainment preparation and the assets that NGBs of game give their competitors from the Adolescent Olympic Games to the Olympics level, and second, to look at NGB representatives' view of web-based entertainment preparation and schooling utilized by athletes.	Using online entertainment for instruction and preparation gives considerable advantages or fulfillment to competitors, limiting difficulties. The presence of online entertainment for instruction and preparing furnishes sports correspondence experts with information about the types of preparation and assets that currently exist.
(Sarmiento et al., 2019)	162,089 youth sports coaches, 13,598 high school sports coaches	-	Atlanta	Trainer	All sports	Centers for Disease Control and prevention (CDC) online concussion training HEADS UP	The purpose of this study was to increase the knowledge of young athlete coaches in terms of preventing, identifying, and managing concussions in young athletes.	HEADS UP online training (CDC) can help coaches of young athletes recognize the signs and symptoms of concussions so that coaches know better how to treat, respond to concussions, and prevent them.
(Hülsmann et al., 2018)	74	-	Bielefeld	Trainer	All sports	The rehabilitation training app uses a combination of rule-based segmentation and adaptive enhancement.	This study proposes a new channel for detecting trainee errors during training designed to automatically generate feedback for trainees.	Recovery preparation applications are reasonable for conveying criticism verbally or in a CAVE-based sports preparing climate in computer-generated simulation that will propel the field of sports training and restoration under virtual conditions.

(He et al., 2018)	79 males, 97 females	20 - 40 years	China	Coach	Chinese Gymnastics (Gym) and rhythmic gymnastics (R-Gym) trainer.	Web	Investigate how the coaches from different countries learn to train and what would be their ideal source for acquiring knowledge.	Exercise and R-Exercise center game mentors should not be mistaken for Chinese coaches for different games. Not directing an examination using a portion of the qualities a mentor may have explained the differences between the mentor's points of view, e.g., long periods of training experience and professional assumptions.
(Daugherty et al., 2019)	Boys 59,429 33.1 Girls 35,268 19.7 Both 84,506 47.1 N/A 263	5 - 18 years old	USA	Athlete	Multi sports	Disease control and concussion prevention online training	Furnish coaches with appropriate information and Abilities; the US Communities for Infectious prevention and Avoidance Centers for Disease Control and prevention (CDC) sent fair warning: blackout in youth sports web-based preparation.	HEADS UP training increases trainers' knowledge of specific topics and helps them feel more comfortable about responding to concussions among their athletes. This study provides insight into how to focus on the concussion health education efforts of HEADS UP to suit the information needs of trainers.
(Oishi et al., 2022)	3 boys and 2 girls	23-26 years old	Tsukuba	Graduate student	Sports and Physical Education	Online courses	The reason for this study is to examine the encounters of five Japanese alumni understudies (expert level) in a web-based course in global harmony and advancement through sports involving English as the language of guidance.	The obtained results showed that Japanese postgraduate students experienced positive improvements in language and sports skills and meaningful experience when enrolling in international development and peace through sports courses.

The objectives of online courses and online coaching are very diverse and based on the community's needs and each country's needs. In summary, the majority of articles showed that the courses adopt a process similar to research stages: starting from analyzing the perceptions of the trainers regarding online courses, applying an in-depth understanding of the material, exploring previous uses of the programs, and giving feedback for evaluating next stages of programs. All programs are individually tailored to the needs of the participants.

Discussions

The chosen articles show that the outcomes are positive, and online courses have a considerable effect because they allow to readily acquire data connected with their necessities. Data innovation has become essential for sports improvement. Innovative advances and modern improvement 4.0 are changing the manner in which individuals impart and gain knowledge on the web (Rahman et al., 2019). Peter & Manzini (2020) state that a typical individual spends 23.8 h online every month. Individuals in North America spend 37.2 h, in Europe – 26.8 h, and in Asia Pacific – 17.2 h, which is anticipated to increase. The abovementioned researchers also stated that in 2015 there were 35 billion gadgets associated with the web including PCs, tablets, and cell phones. This number is expanding. Specifically, getting additional online resources is easy because everybody is using the

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web. Peter & Manzini (2020) state that online courses are an inventive answer for the quick impacting world. This advancement affects the development of instruction and preparation by developing new experiences outside customary practices (Ellahi, 2018). Online courses are widely used at colleges (Goodman et al., 2019) and will be broadly used in conventional training and expert improvement programs (Macy et al., 2021).

Online courses are a successful method for getting immediate and constant input; however, few places offer courses with novel strategies. The positive aspect of non-concurrent strategies is that members can use the course at their own learning pace. There is always something to learn using different techniques. Online courses can assist them with working on their abilities, widening their insight, and learning, particularly in sports. This agrees with research discoveries of (Lean et al., 2020), where expert school understudies favor internet learning. Online courses are progressively viewed as a compelling method for preparing coaches (Farhat et al., 2022).

Numerous online courses and exploratory examinations have been completed in different nations, one of which is by utilizing the media website (Farhat et al., 2022) (Song, 2021) (Kjær, 2019) (He et al., 2018). This review shows that online courses offer reasonable data that can be readily utilized by athletes and are viewed as simple to explore and obtain data, can recreate ideal levels and conditions in athletes, and upgrade their capacity to improve. This approach has been approved by most coaches and athletes. (Chieng & Tan, 2021) state that the Internet can invigorate educators to make site-based learning media that can be obtained to by members anywhere and at any time. This is also confirmed by (Danaswari & Gafur, 2018). The advantage of using a website as a learning medium is that it contains intuitive visual and audio information that can be used to improve experience to support free learning. Educational websites can be used as gathering venues for fostering the quality of trainers in the long-term.

The obtained results showed no significant difference during the intervention, directly or indirectly. Although consistency was different, the results were similar. This occurred due to the independence of the trainers or participants to take online courses. They want and are not forced to take it; thus, online and offline training results are not significantly different. The use of this technology has significant benefits; it allows to obtain best practices and recommendations for improvement, especially in sports. However, there are limitations in using English in Asian countries, which is an inhibiting factor for equal access to information. In the future, language diversification can be implemented by institutions or platforms (e.g., applications such as language translators) to allow potential users to choose preferred language. A more in-depth research can be performed if the scope is narrowed. For example, in Southeast Asia or in developing countries, the input and suggestions may be more in line with what is needed and evenly distributed. If this is not done, there may be a gap in equal access to information in various countries.

Conclusions

The results of this study show that the online course conducted in the sports field is practical and a solution because coaches in various countries obtain the same information. Online courses have a considerable effect because they allow to readily acquire data connected with their necessities. Online courses are progressively viewed as a compelling method for preparing coaches. The use of this technology has significant benefits; it allows to obtain best practices and recommendations for improvement, especially in sports. The many positive aspects of online courses are clear, and the shortcomings can be eliminated with further research, e.g., by adding a translator or subtitle feature that is country specific. Due to language differences, people from countries that do not use English in their daily life have more difficulty taking online courses. Future research will discuss in depth the differences between developed and developing countries in online courses in sports, especially for coaches, in terms of perception, evaluation, and the effectiveness of online course programs. The identified gaps will be used for the subsequent application development.

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