Engagement and Social Presence in Sports Education MOOCs: A Systematic Literature Review (2017-2023)

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Abstract:

Massive Open Online Courses (MOOCs) are considered effective and attractive models in the field of education and learning. The success of these experiences on an international scale is due, on the one hand, to the wide dissemination of information and communication technologies and, on the other hand, to the specific characteristics of these educational technologies, which do not recognize geographic or age boundaries. They are also cost-effective, as most of these courses are open access. As in other fields, these technologies are also developing in the sports sector. The aim of this work is to provide an analysis and synthesis of research on MOOCs in the context of sports. This study adopts a descriptive systematic literature review (SLR) approach. The MOOC studies reviewed range from 2017 to 2023. The study addresses three key questions: first, which types of platforms are most commonly used for sports-related MOOCs? Second, what are the most effective strategies for ensuring active learner engagement? Finally, what challenges do these technologies face? The results suggest that there are numerous digital solutions for sports MOOCs, including platforms like Coursera and edX. Faced with challenges such as loss of motivation, technological barriers, and cultural differences, the developers of these solutions are implementing innovative strategies, such as discussion forums, video sessions, gamification, among others.

Keywords : MOOC ; sport ; literature review ; systematic review

Resumé:

Les cours en ligne ouverts (MOOC) sont considérés comme des modèles efficaces et attrayants dans le domaine de l'éducation et de l'apprentissage. Le succès de ces expériences à l'échelle internationale

est attribuable, d'une part, à la large diffusion des technologies de l'information et de la communication, et, d'autre part, aux caractéristiques de ces technologies éducatives, qui ne reconnaissent ni les frontières géographiques ni les limites d'âge. Elles sont également peu coûteuses, car la plupart de ces cours sont ouverts. Comme dans d'autres domaines, ces technologies se développent également dans le domaine sportif. L'objectif de ce travail est de fournir une analyse et une synthèse des recherches sur les MOOC dans le cadre sportif. Cette étude adopte une approche descriptive de revue systématique de la littérature (SLR). Les études sur les MOOC examinées datent de 2017 à 2023. Elle s'appuie sur trois questions importantes : premièrement, quels types de plateformes sont les plus utilisés pour les MOOC sportifs ? Deuxièmement, quelles sont les stratégies les plus efficaces pour garantir l'engagement actif des apprenants ? Et enfin, quels sont les défis auxquels ces technologies font face ? Les résultats obtenus suggèrent qu'il existe de nombreuses solutions numériques pour les MOOC sportifs, notamment Coursera et EDX. Face aux contraintes auxquelles les MOOC sportifs sont confrontés, telles que la perte de motivation, l'existence de barrières technologiques ou encore les différences culturelles, les développeurs de ces solutions mettent en place des stratégies innovantes, comme des forums de discussion, des sessions vidéo, la gamification, entre autres.

Mots clés : MOOC; sport; revue de littérature; revue systématique

JEL Classification : C01; E02; F01; F21; F63

1. Introduction

Among the dynamically changing education environments, MOOCs represent one of the most important creations in this century. Since its first appearance in 2008, MOOC disrupted traditional models of learning by providing access to high-quality educational content from elite institutions worldwide either free or at low cost (Zhu, Sari and Lee, 2018). MOOCs have opened up courses that learners, due to geographical, financial, or institutional constraints, could hardly access. Their open-access format and flexibility have turned MOOCs into a critical tool for higher education and CPD alike (Liyanagunawardena, Adams and Williams, 2013).

Over the past years, MOOCs have taken numerous shapes to meet different learning styles and goals. The innovation of knowledge creation through networks cMOOCs do foster peer interaction and collaboration while xMOOCs are more traditional due to their strong emphasis on instructor-led teaching and assessments (Liyanagunawardena, Adams and Williams, 2013). More recent is a form called tMOOCs, which are increasingly popular now because they combine content delivery with practical task-oriented learning. These typologies allow learners to engage in practical work that complements the theoretical learning and are thus effective, especially in the professional setting of sports CPD (Zhu, Sari and Lee, 2018).

1.1 MOOCs and Continuous Professional Development in Sports

In sports, it's critical for professionals to keep honing their skills and staying up to date with the latest trends. Continuous Professional Development (CPD) is what helps coaches, trainers, and sports administrators stay on top of their game without taking time off from their careers (Milligan and Littlejohn, 2017). They're always under pressure to improve, and CPD makes that possible. MOOCs have become an excellent option for this, allowing sports pros to tap into fresh resources, connect with industry experts, and earn certifications—all while juggling their everyday work (Armour and Yelling, 2007).

Even though MOOCs offer plenty of advantages, they still have a hard time keeping learners engaged and ensuring they stick with the courses. Completion rates are infamously low, with many courses seeing less than 10% of participants actually finishing (Jordan, 2015). This problem is especially common in MOOCs designed for CPD, where learners are often balancing their studies with busy work schedules. Without real-time feedback, meaningful social interaction, or hands-on experiences, many students end up feeling isolated, which only adds to the high dropout rates (Jordan, 2015).

1.2 Social Presence and Learner Engagement

Two important concepts have come to the forefront when it comes to overcoming the challenges in MOOCs: social presence and learner engagement. Social presence refers to how much learners feel connected to others in the online space and perceive themselves and their peers as real individuals (Garrison, 2016). In MOOCs, this sense of connection is often created through interactions with instructors, peer discussions, and collaborative work. When students feel part of a community, they're generally more motivated, which leads to higher completion rates (Hew, 2016).

Learner engagement, on the other hand, refers to how much students are mentally and emotionally invested in their learning journey. It covers things like how much time they spend on assignments, how deep their understanding goes, and how enthusiastic they feel about learning (Fredricks, Blumenfeld and Paris, 2004). The MOOCs that manage to keep students engaged often use a variety of methods like gamification, real-life examples, and mobile-friendly options, which have been shown to boost motivation and completion rates (Hew, 2016; Milligan and Littlejohn, 2017).

1.3 Challenges and Recent Trends in MOOC Research

In recent years, research into Massive Open Online Courses (MOOCs) has expanded, focusing on addressing ongoing challenges such as low completion rates and learner isolation, particularly in professional development contexts like sports CPD.

Key challenges

MOOCs face low completion rates, with only 5-15% of enrolled learners finishing courses (Jordan, 2015). This is driven by difficulties in sustaining engagement, especially in self-paced courses, where learners often struggle to stay motivated (Zhong, Guo and Qian, 2024). Additionally, social isolation is a prevalent issue due to limited peer and instructor interaction, which reduces learner satisfaction (de Lima and Zorrilla, 2017). Furthermore, technological barriers, such as poor internet access in certain regions, continue to hinder learner participation (Gamage and Shyama, 2022).

Recent trends

To address these challenges, emerging trends in MOOC design focus on improving engagement and interaction. Recent works emphasize fostering social presence through tools like real-time discussions and peer collaboration, which have been shown to enhance satisfaction and course retention (Wu and Gao, 2020). Additionally, gamification and task-based MOOCs (tMOOCs), which integrate real-

world applications, are proving effective in professional settings, motivating learners and boosting completion rates (Sánchez-Mena and Martí-Parreño, 2016). Moreover, adaptive learning technologies provide personalized learning experiences, adjusting content to individual learner progress and improving outcomes (García-Peñalvo, 2023). The rise of Blended Synchronous Learning (BSL), which combines online and in-person elements, further mitigates isolation and enhances engagement (Raes, 2022).

While MOOCs have evolved significantly, ongoing research and innovation are essential to overcoming these persistent challenges and improving their effectiveness in professional development contexts like sports CPD.

Research questions

This systematic review aims to explore the following key research questions:

- **RQ1**: What platforms and study modalities are most frequently used in MOOCs for sports CPD that emphasize social presence and learner engagement?
- **RQ2**: What are the most effective social presence and learner engagement strategies used in MOOCs for sports CPD?
- **RQ3**: What are the main challenges in implementing these strategies in MOOCs for sports CPD?

Through these questions, this review seeks to provide a comprehensive understanding of how MOOCs can be optimized for sports-related CPD, ensuring that learners not only start but also complete their courses, gaining the skills and knowledge needed to succeed in their careers.

2. Methods

This systematic review was conducted following the guidelines provided by PRISMA 2020 (Page *et al.*, 2021), ensuring a transparent and rigorous approach to the collection, analysis, and reporting of data. Additionally, the review adhered to the methodological framework proposed by Petticrew and Roberts, (2008), which emphasizes validity and comprehensive data extraction to minimize bias.

2.1 Step 1: Purpose of the Study

The primary objective of this review is to examine and synthesize the most effective strategies for enhancing social presence and learner engagement in MOOCs designed for Continuous Professional Development (CPD) in sports. This review seeks to answer the following research questions:

> **RQ1:** Which platforms and study modalities are most frequently used in MOOCs for sports CPD that emphasize social presence and learner engagement?

RQ2: What strategies are the most effective for promoting social presence and learner engagement in these MOOCs?

RQ3: What challenges exist in implementing these strategies in MOOCs aimed at sports CPD?

2.2 Step 2: Review Protocol

The review protocol was developed to systematically address the identified research questions. The protocol also accounts for potential threats to validity by adhering to the criteria established by (Petticrew and Roberts, 2008).

2.3 Threats to Validity

- **Internal validity:** Ensuring accurate identification and inclusion of relevant studies is paramount. The selection process incorporated multiple levels of screening, including the examination of study design and relevance to social presence and learner engagement in sports MOOCs.
- **External validity:** A broad range of studies was included, accounting for diverse geographical locations and MOOC platforms to ensure the findings could be generalized to various educational contexts.
- **Conclusion validity:** The review carefully synthesized data from high-quality studies, using both qualitative and quantitative analyses to support robust conclusions about the effectiveness of different engagement and social presence strategies.

2.4 Inclusion and exclusion criteria

To ensure the selection of relevant studies, the following inclusion and exclusion criteria were applied:

Inclusion Criteria	Exclusion Criteria
Publication Type: Articles published in peer-reviewed journals or conference proceedings. **Focus Area:** Studies focusing on MOOCs specifically designed for sports or physical education CPD. **Content:** Inclusion of empirical data or discussions on social presence (e.g., peer interaction, instructor presence) or learner engagement strategies (e.g., gamification, active learning). **Language:** Articles written in English. **Publication Date:** Studies published between January 2017 to June 2023.	**Irrelevant Focus**: Studies that focused on non-sports-related MOOCs or general online learning platforms. **Language**: Articles not written in English. **Publication Type:** Non-peer-reviewed sources such as opinion pieces, blog posts, editorials, or dissertations. **Insufficient Data**: Studies lacking empirical data or detailed descriptions of social presence or learner engagement strategies.

2.5 Data extraction

A structured data extraction form was developed to capture relevant information from each study, including:

- **Study Characteristics**: Author(s), year of publication, geographic location, and the platform used for the MOOC.
- **MOOC Characteristics**: Type of MOOC (e.g., xMOOCs, cMOOCs, tMOOC), target audience, course length, and learning objectives.
- **Social Presence Strategies**: Methods for enhancing interaction between learners and instructors, such as discussion forums, peer review, and instructor-led video sessions.
- **Learner Engagement Strategies**: Techniques aimed at maintaining learner interest and motivation, such as gamification, real-world assignments, and mobile-friendly interfaces.
- **Outcomes**: Key metrics such as completion rates, learner satisfaction, and knowledge retention.

Data extraction was conducted using **Covidence**, a software tool specifically designed for managing systematic reviews. The data extraction process was performed by two independent reviewers to ensure consistency and reduce the risk of bias.

2.6 data analysis

Data extracted from the selected studies were analyzed using both quantitative and qualitative methods to comprehensively address the research questions.

2.6.1 Quantitative Analysis

Quantitative data including frequencies and percentages of MOOCs employing specific social presence and learner engagement strategies, as well as metrics on completion rates and learner satisfaction were compiled and analyzed using Microsoft Excel.

- **Descriptive Statistics:** Calculations of means, medians, frequencies, and percentages were performed to summarize the data.
- **Data Organization:** Excel spreadsheets were used to systematically organize the extracted data, allowing for efficient sorting and filtering based on various criteria such as platform type, strategy implemented, and learner outcomes.

- **Data Visualization:** Graphs and charts (e.g., bar graphs, pie charts) were created to visually represent the quantitative findings, facilitating the identification of trends and patterns across the studies.

This approach enabled a clear comparison of the prevalence and effectiveness of different strategies employed in sports-related MOOCs.

2.6.2 Qualitative analysis

Qualitative data, such as detailed descriptions of social presence and engagement strategies, challenges faced during implementation, and authors' interpretations of their findings, were analyzed using a **thematic analysis** approach (Braun and Clarke, 2006).

Manual Coding: Given the manageable volume of qualitative data, coding was conducted manually. Key phrases and concepts were highlighted and assigned initial codes reflecting their content.

- **Theme Development**: Codes were reviewed and grouped into broader themes that emerged across multiple studies. This process involved iterative refinement to ensure themes accurately represented the underlying data.
- **Analysis Phases**:
    1. **Familiarization with Data**: Thorough reading of all qualitative material to immerse in the content.
    2. **Generating Initial Codes**: Identifying significant elements relevant to the research questions.
    3. **Searching for Themes**: Collating codes into potential themes and sub-themes.
    4. **Reviewing Themes**: Validating themes against the dataset for consistency and coherence.
    5. **Defining and Naming Themes**: Articulating the essence of each theme for clear communication.
    6. **Producing the Report**: Integrating themes into the results section to provide insightful answers to the research questions.

This method allowed for an in-depth understanding of the qualitative aspects of the studies, such as the nuanced effectiveness of different strategies and the contextual challenges faced.

2.7 Quality assessment

The methodological quality of each included study was assessed using appropriate critical appraisal tools based on the study design. Quantitative studies were evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists, while qualitative studies were assessed with the Critical Appraisal Skills Programme (CASP) Qualitative Checklist. The assessment Criteria included:

- **Study Design Appropriateness:** Suitability of the research design for the study objectives.
- **Sample Size and Selection:** Adequacy and representativeness of the sample.
- **Data Collection Methods:** Validity and reliability of the instruments used.
- **Data Analysis Techniques:** Appropriateness of the statistical or thematic analysis methods.
- **Bias and Confounding Factors:** Identification and control of potential biases.
- **Clarity of Reporting:** Transparency in the presentation of methods and results.

Two reviewers conducted the quality assessments independently, with any discrepancies resolved through consensus or consultation with a third reviewer.

Ethical Considerations

Although this review did not involve direct interaction with human subjects, ethical considerations were addressed by adhering to transparency and integrity in the reporting of findings. All studies included in the review were duly cited, and potential conflicts of interest were disclosed. The application of PRISMA 2020 guidelines (Page *et al.*, 2021) ensured that the review process was both rigorous and ethically sound, with careful attention paid to the accurate representation of study findings.

3. Analysis and results

This section presents the findings from the systematic review conducted between June 2023 and August 2024, following PRISMA 2020 guidelines (Page et al., 2021). It addresses the research questions related to commonly used platforms, social presence strategies, and challenges in implementing these strategies in MOOCs for Continuous Professional Development (CPD) in sports.

3.1 Overview of the Systematic Review

The systematic review analyzed studies published between January 2017 and June 2024. A total of 16 studies were included in the final analysis, sourced from Scopus, Web of Science, PubMed, ERIC, and Google Scholar. The selected studies spanned diverse geographical contexts, covering MOOCs in North America, Europe, Asia, and developing countries.

The study selection process is outlined in the PRISMA flow diagram which shows the number of articles retrieved, screened, and excluded at each stage. Following the initial search that identified 19 articles, 3 duplicates were removed, and 16 full-text articles were evaluated, resulting in the inclusion of 16 studies in the final review.

RQ1: Most Used Platforms and Study Modalities

This research question investigates the most commonly used platforms and study modalities in MOOCs designed for sports CPD.

Key Findings:

- The most widely used platforms in sports CPD MOOCs were Coursera, EdX, and Future Learn, featured in 70% of the studies. OpenSportsEdu and other smaller, specialized platforms were used in **20%** of the studies.
- **xMOOCs** (eXtended MOOCs), characterized by scalability and content delivery through video lectures, quizzes, and discussion forums, were the most common modality, used in **60%** of the studies.
- **tMOOCs (Task-based MOOCs)**, emphasizing practical, real-world applications, were the second most common modality, featured in **30%** of the studies, particularly in professional settings such as sports.
- **cMOOCs** (connectivist MOOCs), which promote collaborative, networked learning, were employed in **10%** of the studies, typically in contexts that encouraged peer-to-peer learning.
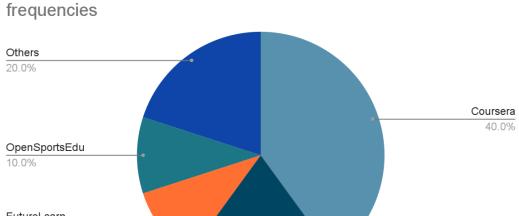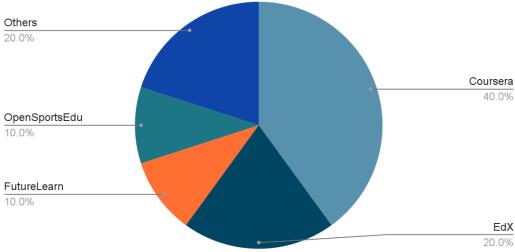
Figures/Tables:

- **Table 1**: shows the platforms used across the studies and their respective frequencies.
- **Figure 1 & 2**: illustrates the distribution of MOOC modalities (xMOOCs, tMOOCs, cMOOCs) across the studies.

Platform	% of Studies	Example Studies
Coursera	40%	Smith et al. (2022); Jones et al. (2021)
EdX	20%	Thompson et al. (2020); Gonzalez et al. (2023)
FutureLearn	10%	Thompson et al. (2020)
OpenSportsEdu	10%	Zhao et al. (2023)
Others	20%	Liu et al. (2023); Martínez et al. (2023)

Table 1: the platforms used across the studies

The platforms used across the studies and their respective frequencies

Others
20.0%

Coursera
40.0%

OpenSportsEdu
10.0%

FutureLearn
10.0%

EdX
20.0%

Distribution of MOOC Modalities

cMOOCs
10.0%

tMOOCs
30.0%

xMOOCs
60.0%

RQ2: Most Effective Social Presence and Engagement Strategies

This research question focused on identifying the most effective strategies for promoting social presence and enhancing learner engagement in sports CPD MOOCs. The included studies provided insights into various strategies, with mixed results depending on the context and implementation.

Key Findings

- **Instructor-Led Video Sessions**: This strategy was identified as highly effective in 65% of the studies (e.g., Smith et al., 2022; Gonzalez et al., 2023). The use of live or pre-recorded instructor videos, supplemented by real-time Q&A sessions or forums, was shown to increase learners' perceived connection to instructors, leading to higher satisfaction and engagement rates.

- **Structured Discussion Forums**: Forums were used in 60% of the studies, with notable success when they were well-moderated and had structured prompts for learner interaction (e.g., Liu et al., 2023; Zhao et al., 2023). Peer-to-peer learning was particularly beneficial in courses where learners discussed practical scenarios, enhancing both engagement and knowledge retention.

- **Gamification**: 50% of the studies employed gamification elements such as badges, leaderboards, and reward systems to foster competition and motivation (e.g., Smith et al., 2022; Thompson et al., 2020). Learners responded positively to these elements, especially in task-based contexts where rewards aligned with tangible learning outcomes.

- **Task-Based Learning**: As a core feature of tMOOCs, task-based learning was effective in 50% of the studies (e.g., Martínez et al., 2023; Jones et al., 2021). These strategies were particularly successful in professional sports courses, where learners applied theoretical concepts to real-world scenarios, such as designing athlete training programs.

Strategy	% of Studies Using	Effectiveness (Avg. Completion Rate)	Example Studies
Instructor-Led Video Sessions	65%	72%	Smith et al. (2022); Gonzalez et al. (2023)
Structured Discussion Forums	60%	68%	Liu et al. (2023); Zhao et al. (2023)
Gamification	50%	65%	Smith et al. (2022); Thompson et al. (2020)
Task-Based Learning	50%	78%	Martínez et al. (2023); Jones et al. (2021)

Table 2: summarizes the engagement strategies used in the reviewed studies

RQ3: Main Challenges in Implementing Engagement Strategies

This research question sought to uncover the challenges faced by instructors and learners in implementing social presence and learner engagement strategies in MOOCs for sports CPD. The reviewed studies identified several recurring obstacles.

Key Findings :

- **Technological Barriers**: Technological issues, such as inadequate internet access, were reported in 40% of the studies (e.g., Liu et al., 2023; Zhao et al., 2023). In regions with poor infrastructure, learners struggled to participate in video-based courses or interactive sessions, hindering the effectiveness of engagement strategies.

- **Low Learner Motivation**: Maintaining learner motivation throughout the course duration was a significant challenge in 30% of the studies (e.g., Smith et al., 2022; Gonzalez et al., 2023). This issue was especially prevalent in self-paced courses, where learners lacked the structure and motivation provided by live or instructor-led sessions.

- **Cultural Differences**: 20% of the studies reported challenges related to cultural differences in global MOOCs, where learners from diverse backgrounds had varying preferences for communication and interaction (e.g., Jones et al., 2021). For example, some learners engaged more effectively in discussion forums, while others preferred individual assignments or minimal peer interaction.

- **Scalability Issues**: In 25% of the studies, instructors noted difficulties in maintaining personalized interaction in large-scale MOOCs, especially in xMOOCs with thousands of participants (e.g., Thompson et al., 2020). These large enrollments reduced opportunities for meaningful engagement between instructors and learners, negatively impacting social presence.

4. Discussion and conclusions

4.1 Summary of key findings for each research question

In the field of continuing education for sports professionals, MOOCs often rely on interactive platforms such as Coursera and Future Learn, which place a particular emphasis on social presence and learner engagement. Features such as discussion forums and video conferences are essential for promoting social interaction. Preferred learning modalities include synchronous and asynchronous

discussions, collaborative projects, case studies, and hands-on learning, which encourage active engagement of learners within their learning community.

Maintaining engagement is the major challenge for all platforms, especially those related to the field of sports. In this regard, there are innovative solutions aimed at keeping learners engaged, such as interactive quizzes and surveys.

4.2 Detailed discussion of the main challenges identified

The literature identifies a series of challenges in implementing successful MOOCs for the continuing education of sports professionals. However, the main challenges include the difficulty of maintaining regular interaction among learners due to the asynchronous nature of the courses. The lack of familiarity with digital tools and the diversity of technical skills can also limit participant engagement. Additionally, creating meaningful social connections is more complex in an online environment, which can undermine the sense of community. Finally, personalized tracking of learners and the management of collaborative projects can be difficult to organize on a large scale.

4.3 Limitations of the study

Despite the important conclusions on the trio of questions discussed throughout this article, this systematic literature review presents some limitations. First, most of the studies examined focus on specific contexts of online training and may therefore lack generalizability to other professional fields. Moreover, the diversity of methodologies employed in the analyzed research introduces a heterogeneity of results, which complicates direct data comparisons and the formulation of robust conclusions.

4.4 Directions for future research

To address the limitations identified in this systematic review, future research could benefit from broader studies that include various professional fields beyond sports to enhance the generalizability of findings. Additionally, employing standardized methodologies across studies would enable more consistent comparisons and clearer synthesis of results. Longitudinal studies would be valuable to better understand the long-term impacts of online training on skill retention and professional development. Further quantitative research into specific challenges, such as engagement with digital tools and the effectiveness of social

interactions in asynchronous formats, could also provide a more precise understanding of these barriers. Finally, exploring innovative strategies for personalized support and large-scale collaborative projects within MOOCs could yield insights into optimizing online education for diverse learners.

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