Journal of Physical Education and Sport ® (JPES), Vol 19 (Supplement issue 6), Art 352 pp 2328 – 2333, 2019
online ISSN: 2247 - 806X; p-ISSN: 2247 – 8051; ISSN - L = 2247 - 8051 © JPES

Original Article

Research on a massive open online course (MOOC): a Rapid Evidence Assessment of online courses in physical education and sport

TOTO GIUSI ANTONIA[1], LIMONE PIERPAOLO[2],
[1,2] Department of Humanistic studies, University of Foggia, ITALY

Published online: November 30, 2019
(Accepted for publication: November 15, 2019)
DOI:10.7752/jpes.2019.s6352

Abstract

Background: In the field of online learning, a new niche sector is spreading throughout the world in the Massive open online courses: MOOCs for sport and physical education.

Aim: The aim of this paper is to analyze the reference literature in relation to MOOCs and sports and to trace the research paths that the studies are taking in the contributions of the last five years.

Methods: The research used combined terms for each main concept of MOOC, e-learning, sport and physical education in electronic databases. For inclusion, didactic interventions were to aim at online instruction, such as virtual physical education, supplementary courses, and online courses based learning. No theoretical designs have been included. The studies were excluded even if the interventions focused mainly on the diffusion of sports communication and physical education, which had no educational implications.

Results: the international scientific literature has strongly focused on the three themes of: (1) design studies and implementation of the online education, (2) outcome measures: cognitive, affective, psychomotor, and assessment tools, (3) student performance, perceptions, facilitators and obstacles of students and teachers.

Discussion: scientific research in the field of MOOCs for sport, seeking abandoning the classic themes of study they are addressing to new issues that appear clearly to be: 1) Student Use and Perceptions, 2) Teacher Uses and Perceptions, 3) Student Physical Education Learning Outcomes.

Key Words: - Sport MOOC, E-learning, Physical education, Online education

Introduction

The online learning system is specialized in offering courses in the most diverse subjects. The distance education modality overcomes the previous teaching model centred on teachers and characterized by students who passively accepted the knowledge. MOOCs, and online learning in general, according to several studies (Daradoumis, et al., 2013) promote proactive knowledge (Jiao, 2018), stimulate self-regulated learning dynamics, overcome cognitive dependence on teachers and traditional study tools (Guàrdia, et al., 2013), improve social exchange skills (Fournier, & Kop, 2015) and interaction with classmates (Chang, et al., 2015). The use of MOOCs for teaching is becoming widespread in sports and physical education (Chen, et al., 2017) too, since they are free from the space and time components of traditional learning agencies and allow constant monitoring of educational activities and progress of the students (Admiraal, et al., 2014). The MOOC are online courses, free and massive (Pozón-López, et al., 2019), whose main feature is associated with all students - regardless of their curriculum, age or social background (free version). Even the geopolitical location does not influence these online courses, in fact they easily reach also economically or culturally disadvantaged areas. Another effect of large numbers of subscribers is the great quality of the teachers and teachings taught. "MOOC" is not just a video course that provides theoretical knowledge online, but also has an interactive area that better meets the needs of the students' mutual discussion (Atapattu, et al., 2017). A specialization of the interactive area of the MOOC concerns the presence of highly qualified tutors, who simultaneously answer the questions asked by the students, also increasing moreover the levels of self-learning (Toto, & Limone, 2019). The aim of this paper is to analyze the reference literature in relation to MOOCs and sports and to trace the research paths that the studies are taking in the contributions of the last five years.

Material and methods

This research uses a Rapid Evidence Assessment (REA), a shorter version of a complete systematic review, originally devised to rapidly investigate political decision-making (Barends, et al., 2017), now also used for scientific literature reviews in the most disparate sectors. An REA is in other words a shortened form of systematic review useful for determining the feasibility of an intervention or activity, if it is appropriate (ethically or culturally), and it can provide a brief summary of the known studies on a given intervention. However, REAs use a rigorous systematic review of methods for searching and evaluating literature, even if the completeness of the research and other revision phases are limited. REA has the advantage of being able to be

Corresponding Author: TOTO GIUSI ANTONIA, E-mail giusy.toto@unifg.it

undertaken rapidly over a wider range, if compared to a systematic review or meta-analysis. Speed is sometimes important in research, for example in gathering information to support research questions. The main characteristics of REA are more limited research questions, easier - but less accurate - research and more, faster data extraction and evaluation division. REAs are a combination of rapid review and narrative investigation techniques used in response to a clinical question or survey.

Inclusion and exclusion criteria

The research was conducted on studies published in English. The aim of the research was to identify the studies that evaluate testing and dissemination of the Mooc in relation to physical education and sport. For inclusion, didactic interventions aimed at online instruction, such as virtual physical education, supplementary courses, and online courses based learning. These didactic models (virtual, blended, simulated, interactive) have now entered the vocabulary of training, including physical education courses and literature. No theoretical designs have been included. The studies were excluded even if the interventions focused mainly on the diffusion of sports communication and physical education, without educational implications. Other exclusions concerned papers dealing with the relationship between technology addiction and sport (Toto & Strazzeri, 2019); or practical studies related to the online use of tools for physical education teachers for non-instructive purposes. Furthermore, abstracts, conference proceedings, book chapters, unpublished dissertations and articles published on non-peer-reviewed papers that did not meet the eligibility criteria for this REA were excluded. The main interesting results were those concerning the relationship between MOOC and sport (eg. Quantity x frequency, poisoning events), MOOC and physical education (eg crime, self-discipline measures) and autonomy skills stimulated by online courses in sportsmen.

Research strategy

The research used combined terms for each main concept of MOOC, e-learning, sport and physical education. We considered only studies published between 2015 and 2019. We searched the electronic databases Scopus, Web of Science, EBSCO (ERIC), Physical Education Index, PsycINFOEmbase, Google scholar. Further efforts have been made to identify potentially significant new works through the analysis of the experiments and the publications on the main MOOC delivery platforms: Future Learn, Cousera, edX, Udacity, Iversity, Eduopen, EMMA, Federica. Each identified reference was evaluated by both authors for potential relevance and inclusion criteria were applied. So, we identified three categories: (1) design studies and implementation of the online instruction used in the study; (2) outcome measures: cognitive, affective, psychomotor, and assessment tools; (3) results studies: student performance, perceptions, facilitators and obstacles of students and teachers.

Results

In total, 1513 titles were identified by the searches and 1089 of them remained after the exclusion of duplicates. Of these, 1008 titles were excluded during title and abstract screening, with reference to theoretical designs, interventions focused on the diffusion of sports communication and physical education, which had no educational implications or on the dissemination of technological and digital tools for non-instructive purposes. 81 relevant studies emerged from this selection. From a more accurate control (substantial as well as formal), other 68 titles were excluded because they did not meet the inclusion criteria: abstracts, conference proceedings, book chapters, published dissertations and articles published on non-peer-reviewed papers. Table 1 represents the classification of the three categories of studies that emerged from this REA procedure:

Table 1. Numerical Analysis of Included Research Studies

Paper	Design studies and implementation of the online instruction used in the study	Outcome measures: cognitive, affective, psychomotor, and assessment tools	Results studies: student performance, perceptions, facilitators and obstacles of students and teachers
Cui, J. (2019).	X		
Griffin, S., & Shrier, I. (2016).	X		
Killian, C. M., Kinder, C. J., & Woods, A. M. (2019).	X	X	X
Koedinger, K. R., Kim, J., Jia, J. Z., McLaughlin, E. A., & Bier, N. L. (2015).		X	
Lee, Y., & Rofe, J. S. (2016).	X		
Liu, H., Li, Y., & Tang, J. (2019).		X	
Martin, N., Kelly, N., & Terry, P. (2018).		X	
Picerno, P., Pecori, R.,			X

Raviolo, P., & Ducange, P. (2019).			
Wang, Q., Xu, C., & Shi, J. (2019).		X	
Wang, R., & Wen, Y. (2015).	X	X	X
Wang, Z., & Hao, B. (2018).			X
Wei, F. U. (2017).			X
Zhang, B. (2017).			X

Sources: Scopus, Web of Science, EBSCO (ERIC), Physical Education Index, PsycINFOEmbase, Google scholar

The number present in Table 1 shows how the studies share equally the sectors investigated and that the international scientific literature has strongly focused on the three themes of: (1) design studies and implementation of the online education, (2) outcome measures: cognitive, affective, psychomotor, and assessment tools, (3) student performance, perceptions, facilitators and obstacles of students and teachers. From the analysis instead of the contents present in Table 2, it is clear how scientific research in the field of MOOCs for sport, seeking abandoning the classic themes of study and addressing new issues that clearly appear to be: 1) Student Use and Perceptions, 2) Teacher Uses and Perceptions, 3) Student Physical Education Learning Outcomes.

Table 2. Overview of Reviewed Studies of Online courses for sport and Physical education

Authors	Type	Summary and key points
Cui, J. (2019).	Paper	It is necessary to explore the application of information technology in college physical education. Based on the author's learning and practical experience, this paper first analyzes the development and application of information technology in college physical education, then summarizes the problems in college physical education informatization, and finally puts forward the reform approach of college physical education informatization in the new era.
Griffin, S., & Shrier, I. (2016).	Paper	In 2015, over 30 000 students from nearly 200 countries enrolled in the first massive open online course (MOOC) in sport and exercise medicine (SEM)—the body matters. Through the combination of a professor's vision and digital technology, this MOOC delivered the equivalent of 200 years of academic endeavours over 3 months. In addition, utilising social media1 and the linked *BJSM* blogs, the course demonstrated why MOOCs are considered a promising method of education.
Killian, et al., (2019).	Review	Online and blended instruction have emerged as popular teaching methods in the K–12 environment. The asynchronous characteristics of these methods represent potential for improved learning opportunities in physical education. Therefore, the purpose of this scoping review was to provide a comprehensive overview of research, commentary, and practical articles related to the use of these methods in K–12 physical education.
Koedinger, et al., (2015).	Paper	The printing press long ago and the computer today have made widespread access to information possible. Learning theorists have suggested, however, that mere information is a poor way to learn. Instead, more effective learning comes through doing. While the most popularized element of today's MOOCs are the video lectures, many MOOCs also include interactive activities that can afford learning by doing. This paper explores the learning benefits of the use of informational assets (e.g., videos and text) in MOOCs, versus the learning by doing opportunities that interactive activities provide.
Lee, Y., & Rofe, J. S. (2016).	Paper	This study draws on the authors' first-hand experience of designing, developing and delivering (3Ds) a massive open online course (MOOC) entitled 'Understanding Research Methods' since 2014, largely but not exclusively for learners in the humanities and social sciences.
Liu, H., Li, Y., & Tang, J. (2019).	Paper	Digital teaching resources are the core cornerstone of educational informationization. Their construction and application level determine the pace of educational modernization. Digital teaching resources for basic education are an effective guarantee to solve the problem of educational equity in urban and rural areas and promote the co-construction and sharing of high-quality scientific and technological education information resources.
Martin, N., Kelly, N., &	Paper	In this paper, we propose a framework for the design of massive open online courses (MOOCs) based upon the principles of self-determination theory, which posits a

Terry, P. (2018).		relationship between intrinsic motivation and the basic psychological need for autonomy, competence, and relatedness. We also report the results of design-based research that evaluates the application of the framework to a MOOC titled "Elite Sport Performance: Psychological Perspectives.
Picerno, et al., (2019).	Paper	In this paper, smartphones and exergame controllers are proposed as BYOD (Bring Your Own Device) solutions for carrying out the interactive learning activities of an online sport and exercise sciences university program. Such devices can be used as sources of kinematic and physiological data during the execution of some selected physical activities for providing, at the same time, a real-time feedback to the student and a ubiquitous assessment to the teacher.
Stylianidis, et al.,	paper	This paper presents the expert evaluation results of the alpha version of an e-learning platform for supporting dual career of athletes. The platform has been designed and implemented in the context of GOAL (Gamified and Online Activities for Learning to support dual career of athletes) Erasmus+ project. According to the evaluation results, GOAL platform is easy to use, consistent, with a simple user interface and the overall attitude of the evaluators is positive.
Wang, et al., (2019).	Paper	Against the background of the "double first-class" construction of Northwest University, and under the development opportunity of deepening and improving the teaching quality of undergraduate education and implementing the reform of the complete credit system, this study holds that the reform of public physical education curriculum in colleges and universities should innovate the operation mechanism, management mechanism and assessment mechanism.
Wang, R., & Wen, Y. (2015).	Paper	Aiming at the career demands and growth requirement of sport media professional, from a system viewpoint, the paper inquires into the tendency of web-based learning, and discusses MOOC from the angles of origination, construction, performance, organization, application, and serviceability. By completing value analysis of MOOC, the function, cost, value and their corresponding relations are probed, and some useful conclusions are drawn that not the only way of improving efficiency while reducing total cost is impactful.
Wang, Z., & Hao, B. (2018).	Paper	On the basis of MOOC brief introduction on the emergence and development status, college sports programs elaborated abroad IT-oriented development process and present the latest trends in college sports MOOC courses, combining the current status quo of physical education curriculum reform model, drawn for the future development of our country and some inspiration MOOC courses sports applications, provide for the future of our sport MOOC curriculum model available reference for reform.
Wei, F. U. (2017).	paper	Nowadays,with the rapid development of society,the circulation of information has undergone great changes. Big data is the product of this era. It has aroused the birth and development of MOOC,which brings the opportunity to the development and reform of traditional university physical education.
Zhang, B. (2017).	Paper	In recent years, the concept of healthy China has attracted wide attention. Since modern times, China has involved the development of sports academic major sports, but there is still a problem, the major sports projects and project research among their strength is different, therefore there is a lot of strong project; At the same time, there are also some weak project, even the outline.

Discussion and Conclusion

In the traditional sport teaching mode, learning theoretical knowledge repeats the logic of the typical frontal lesson while, during which the teacher / instructor tries to stimulate the students' self-learning interests (exercise) and to verify what they have acquired (consolidation) before moving on to the next lesson. For all the learning uncertainties of the students, the teachers provide answers that emphasize the passivity of the student's knowledge process (questions, tasks to be performed, curiosity in the research). The knowledge provided is almost inert, abstract and theoretical (Limone & Toto, 2018). Specifically in sports teaching, skills are learned through the demonstration and imitation of professional movements. Ample space is left to the intuition of the students in solving problems or performing. Mistakes in movements or negative effects on limbs are also explained by teachers, never explored by students.

From the analysis of the data it is clear how the current state of research has focused on the study of typical categories of the analysis of the classic online lesson rather than moving towards new fields of research. The examination of the contributions clearly shows that the research on MOOCs for sport is focusing on three main themes: 1) Student Use and Perceptions, 2) Teacher Uses and Perceptions, 3) Student Physical Education Learning Outcomes (Strazzeri & Toto, 2019).

In the context of MOOCs, the role of the teacher changes: he is not just transferring contents, but develops them designing new resources and learning materials and generating more personalized teachings,

focusing on students' requests and questions. The dimension of motivation comes also into play, because the individualized intervention stimulates the learner to make continuous progress (Ponticorvo, et al., 2019). In MOOC the dimension of self-learning is of course strongly implemented, since the structure of the program must pursue independence and respect the individual differences of the users. Greater personalization of teaching enables the development of physical education and psychology. The co-construction of knowledge takes place through discussion with tutors and classmates, achieving continuous improvement both on the courses and on learning.

References

Admiraal, W., Huisman, B., & Van de Ven, M. (2014). Self-and peer assessment in massive open online courses. *International Journal of Higher Education*, *3*(3), 119-128.

Atapattu, T., Falkner, K., & Falkner, N. (2017). A comprehensive text analysis of lecture slides to generate concept maps. *Computers & Education, 115*, 96-113. DOI: 10.1016/j.compedu.2017.08.001

Barends, E., Rousseau, D.M. & Briner, R.B. (Eds). (2017). *CEBMa Guideline for Rapid Evidence Assessments in Management and Organizations*, Version 1.0. Center for Evidence Based Management, Amsterdam. Available from www.cebma.org/guidelines/

Chang, R. I., Hung, Y. H., & Lin, C. F. (2015). Survey of learning experiences and influence of learning style preferences on user intentions regarding MOOC s. *British Journal of Educational Technology*, *46*(3), 528-541.

Chen, J. A., Wu, D., Cheng, J. N., Fu, B., Zhang, L., & Lu, A. M. (2017). Application of MOOC teaching in sports course teaching practice. *Eurasia J Math Sci T*, *13*(12), 8089-8097.

Cui, J. (2019, June). Development and Research on the Informationization of Physical Education in Colleges and Universities. In *International Conference on Applications and Techniques in Cyber Security and Intelligence* (pp. 1696-1700). Springer, Cham.

Daradoumis, T., Bassi, R., Xhafa, F., & Caballé, S. (2013, October). A review on massive e-learning (MOOC) design, delivery and assessment. In *2013 eighth international conference on P2P, parallel, grid, cloud and internet computing* (pp. 208-213). IEEE.

Fournier, H., & Kop, R. (2015). MOOC learning experience design: Issues and challenges. *International Journal on E-Learning*, *14*(3), 289-304.

Griffin, S., & Shrier, I. (2016). University of McGill massive open online course: pioneering sport and exercise medicine education. *British Journal of Sports Medicine* (50), 1101-1102.

Guàrdia, L., Maina, M., & Sangrà, A. (2013). MOOC design principles: A pedagogical approach from the learner's perspective. *elearning papers*, (33), 1-6.

Jiao, Y. (2018). 5Understanding learner autonomy through MOOC-supported blended learning environments: an investigation into Chinese MA ELT students' beliefs. *Flipping the blend through MOOCs, MALL and OIL–new directions in CALL*, 33-40.

Killian, C. M., Kinder, C. J., & Woods, A. M. (2019). Online and Blended Instruction in K–12 Physical Education: A Scoping Review. *Kinesiology Review*, *8*(2), 110-129.

Koedinger, K. R., Kim, J., Jia, J. Z., McLaughlin, E. A., & Bier, N. L. (2015, March). Learning is not a spectator sport: Doing is better than watching for learning from a MOOC. In *Proceedings of the second (2015) ACM conference on learning@ scale* (pp. 111-120). ACM.

Lee, Y., & Rofe, J. S. (2016). Paragogy and flipped assessment: Experience of designing and running a MOOC on research methods. *Open Learning: The Journal of Open, Distance and e-Learning*, *31*(2), 116-129.

Limone, P., & Toto G. A. (2018). The psychological constructs and dimensions applied to sports performance: a change of theoretical paradigms. *Journal of Physical Education and Sport*, *18*, 2034.

Liu, H., Li, Y., & Tang, J. (2019). Construction and Application of Digital Teaching Resources in Regional Basic Education—Taking Physical Education Courses as an Example. *Creative Education*, *10*(6), 1192-1204.

Martin, N., Kelly, N., & Terry, P. (2018). A framework for self-determination in massive open online courses: Design for autonomy, competence, and relatedness. *Australasian Journal of Educational Technology*, *34*(2).

Picerno, P., Pecori, R., Raviolo, P., & Ducange, P. (2019, June). Smartphones and Exergame Controllers as BYOD Solutions for the e-tivities of an Online Sport and Exercise Sciences University Program. In *International Workshop on Higher Education Learning Methodologies and Technologies Online* (pp. 217-227). Springer, Cham.

Ponticorvo, M., Schembri, M., & Miglino, O. (2019, June). How to Improve Spatial and Numerical Cognition with a Game-Based and Technology-Enhanced Learning Approach. In *International Work-Conference on the Interplay Between Natural and Artificial Computation* (pp. 32-41). Springer, Cham.

Pozón-López, I., Kalinic, Z., Higueras-Castillo, E., & Liébana-Cabanillas, F. (2019). A multi-analytical approach to modeling of customer satisfaction and intention to use in Massive Open Online Courses (MOOC). *Interactive Learning Environments*, 1-19.

Strazzeri, I., & Toto, G. A. Features and Trends of Social Sciences Applied to Sport in the Italian Context.

Stylianidis, P., Politopoulos, N., Tsiatsos, T., & Douka, S. (2018, September). Design, Development and Evaluation of a MOOC Platform to Support Dual Career of Athletes (GOAL Project). In *International Conference on Interactive Collaborative Learning* (pp. 257-266). Springer, Cham.

Toto, G. A., & Limone, P. (2019). Self-directed learning: An innovative strategy for sport and physical education.

Toto, G. A., & Strazzeri, I. (2019). Sport and physical education as prevention against technological addictions.

Wang, Q., Xu, C., & Shi, J. (2019, August). Research on the Path of Team Building and Mechanism Innovation of Public Physical Education Course Teaching of University. In *5th International Conference on Arts, Design and Contemporary Education (ICADCE 2019)*. Atlantis Press.

Wang, R., & Wen, Y. (2015). Inspiration MOOC Model of College Sports Curriculum under the Information Age. *Sichuan Sports Science*, (5), 32.

Wang, Z., & Hao, B. (2018, October). MOOC and Its Role in the Growth of Sport Media Professionals. In *2018 3rd International Conference on Politics, Economics and Law (ICPEL 2018)*. Atlantis Press.

Wei, F. U. (2017). Influence of MOOC on College Physical Education in the Big Data. *Journal of Guangzhou Sport University*, (3), 28.

Zhang, B. (2017). Research on the Development and Change of Chinese Sports Science Based on Bibliometric Analysis. *Eurasia Journal of Mathematics Science and Technology Education, 13*(10), 6407–6414. doi:10.12973/eurasia.2017.01073a.