

# VIDEO AND ONLINE LEARNING IN HIGHER EDUCATION: A BIBLIOMETRIC ANALYSIS OF THE OPEN ACCESS SCIENTIFIC PRODUCTION, THROUGH WEB OF SCIENCE

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## Abstract

Video is used, today and generally, as a preferential technology for the online broadcast of educational contents, in higher education. This exploratory bibliometric analysis surveys scientific publications written in English, in Open Access, in the field of Education, in the period between 2007 and 2017, considering the following topics: video, higher education, online learning, distance learning and MOOC. Three strings of searches have been used, in total, 96 publications have been identified, mainly articles in journals and respective affiliated authors, also primarily, to institutions of European countries.

Keywords: Educational video, podcasting, MOOC, OCW, OER, university pedagogy, online learning, online distance education, e-learning, bibliometric review, web of science.

## 1 INTRODUCTION

In a context of new literacies [1], it is important for us to list and problematize the place of video (educational audiovisual and educational cinema) in its intersection with online learning (MOOC-Massive Open Online Courses e DL - Distance Learning), and the universe of higher education. What research has been produced in the contemporary world about educational video at this intersection? How many documents were published, of what type and which geographical origin of the reported investigations?

The art of cinema appeared 123 years ago and the golden age of educational cinema was in the 1960s and 1970s, particularly with educational television and all over the world [2]. During the 1980s, it saw some flourishing with video technologies (video reader-recorders and camcorders). However, with the advent of the personal computer, multimedia, Internet and the myth of interactivity, it declined [3].

After 2004, hybridization (merger of functions into technological gadgets) and multiusability (merger of resources in virtual spaces), with the last one duplicating the concept of multimodality (possibility of combining different formats, text, sound, fixed and moving images and objects in 2D and 3D in the same document), they defined and accelerated the concept of media. With the launch of YouTube, in 2005, educational audiovisuals exploded again.

Online learning (online distance courses and support to presential learning), in its turn, appears in the late 1990s and is badged as e-learning in 2001 by the European Commission in its Official Journal [4]. Between multiple efforts of universities worldwide in order to adapt to these trends of dematerialization of educational processes — and in the attempt of capturing new publics that would make it possible to overcome the financial crisis in higher education - MIT (Massachusetts Institute of Technology) went forth in 1999 with the OCW (OpenCourseWare) project. In 2002 the first 50 courses were published. It took longer for the arrival of a business model to support the free availability of content (mainly courses), which initially consisted of converting existing material into an online format [5], with video lessons, exercises, exams, notes, etc. In 2004, OCW adopts the Creative Commons license and opts for an open model called Open Educational Resources (OER), already adopted in the Forum of the Impact of Open Courseware for Higher Education in Developing Countries.

In the sequence of the experience made by Stephen Downes and George Siemens with the Connectivism and Connective Knowledge/2008 course (using the Facebook, Wikis, forums and blogs group), under which around 2 200 students took part, sees the dawn of the MOOC acronym (Massive Online Open Courses).

In 2012, two professors of the University of Stanford, Sebastian Thrun e Peter Norvig, offered the Introduction to Artificial Intelligence course, online and in open access. The course was planned in order to resemble a real class, and had more than 160 000 registered students from 190 countries and, for the first time, using the word massive was made possible. This means that, MOOC arrived, in the universe of higher education, as a natural development of the OCW concept [6, 7,8]. 2012 became known as 'the year of MOOCs'. And in MOOCs, videos dominate the presented content [9, 10, 11].

Considering that educational video has a long tradition and that MOOCs and online learning in higher education are based on video capsules, here we decided to carry out an exploratory bibliometric review of the literature that is considered to be internationally relevant by the community, that is, published in journals, records or books listed in indexed online databases. We selected the last ten years (2007-2017) as this is the period in which work will have been carried out at the intersection of these themes. The intention is that this review may serve as a basis for further investigations, which we will explain in the final section.

## 2 METHODOLOGY

Bibliometrics means quantification of elements present in a written document [12]. It consists of statistical and quantitative analysis of the production and dissemination of scientific knowledge, allowing to verify the development and evolution of scientific [13] and/or thematic areas. We are, therefore, presenting an exploratory bibliometric survey about publications at the intersection of video with online learning and university teaching.

For the bibliometric analysis of the terms "video", "higher education", "MOOC" and "Distance learning", we used the Thomson Reuters Web of Science database. This database guarantees the quality of the query results, uses a subject division that is very accessible to research and provides a very useful tool to select only relevant research information [14]. In addition, this database integrates only peer-reviewed journals.

Using Advanced Search, the universe of data has been limited to the subject (SU) "Education and Educational Research". Within this theme, topics (TS) "video", "higher education", "MOOC" and "distance learning" were defined. The search for topics returns occurrences in titles, abstracts, and keywords. By combining these topics, the following searches were carried out: (1) "online learning AND higher education AND video"; (2) "online learning AND higher education AND video AND MOOC"; and (3) "online learning AND higher education AND video AND distance learning". These three strings of query are justified by the diversity of terms and expressions used in the community to designate online learning, particularly the terms distance learning and MOOC.

For the purposes of refining, only the results of the scientific production carried out between 2007 and 2017, written in the English language, in Open Access were considered. It was also refined by type of publication (article, other, meeting, clinical trial, abstract, editorial) to try to find some relevance between what was published in journals (complete studies) and what was published in conferences (studies or projects or work in progress). Finally, it was refined by the geographical origin of the authors affiliation, to try to identify some global trend.

## 3 RESULTS

On the search performed on September 4, 2018, 130,751 results were found in the search for (SU) "Education and Educational Research", after refining.

For search (1), a total of 71 results; for search (2), 7 results; and for search (3), 18 results (cf. Table 1).

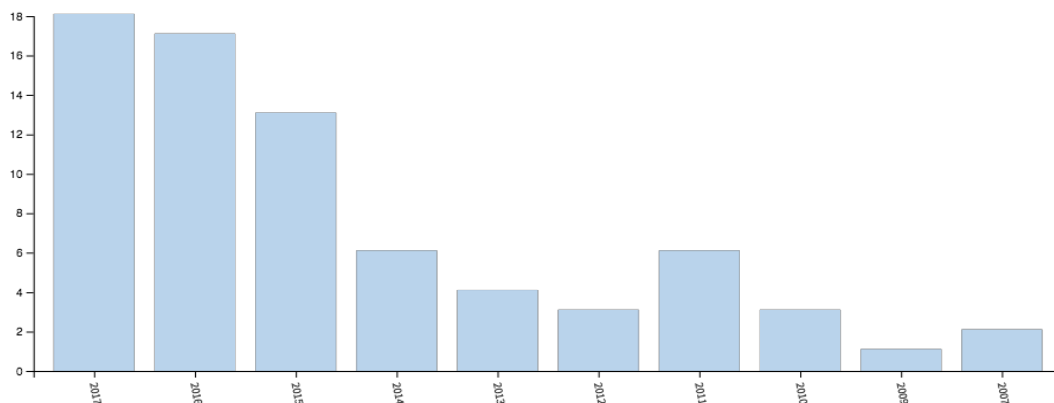
Table 1. General results.

Search no.	Search Topics	Results	(Without Open Access)
Search 1	"online learning AND higher education AND video"	71	(614)
Search 2	"online learning AND higher education AND video AND MOOC"	7	(67)
Search 3	"online learning AND higher education AND video AND distance learning"	18	(139)

This presentation is organized by search strings — (1) (2) (3) — with the following reported in each: the number of publications; the type of publications; and the geographical origin of the affiliations of the authors.

### 3.1 Search 1: online learning AND higher education AND video

This search resulted in 71 publications, whose number grew from 2014 (Graph 1), which is understandable by the greater investment made in OpenCourseWare from 2010, in agreement with the time that the study writing process usually takes, submission, revision and publication. That is, between the completion of the studies and their publication a period can oscillate between six months and two years or more.



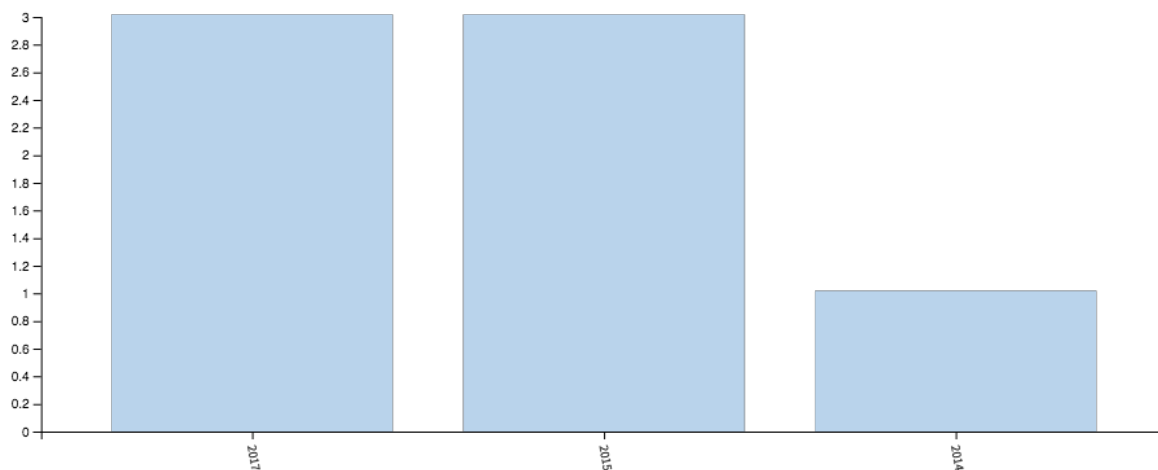
Graphic 1 - Distribution of scientific production in the past 10 years (string 1).

Out of the 71 publications, 64 are journal articles, showing a significant difference compared to other types of publication. This indicates that these publications are reports of completed experiments.

Regarding the origin (affiliation) of the authors of the publications, we identified 31 countries, with publications from 10 European countries (Germany, the Netherlands, Sweden, England, Spain, Turkey, Cyprus, Greece, Portugal, and Romania) that lead the production with higher values - 29 publications (40.85%) – to those submitted by the United States of America (USA) - 21 (29.58%) publications. In any case, it was find production by authors from all continents.

### 3.2 Search 2: online learning AND higher education AND video AND MOOC

This search resulted in 7 publications. The first only appears in 2014, there were 3 in 2015 and 3 in 2017, which is understandable for the addition of the term MOOC, coined as we know in 2008 and assumed in 2012. With this being a complex conjugation that must necessarily include the four terms, this increase is relevant from 2014 to 2017.

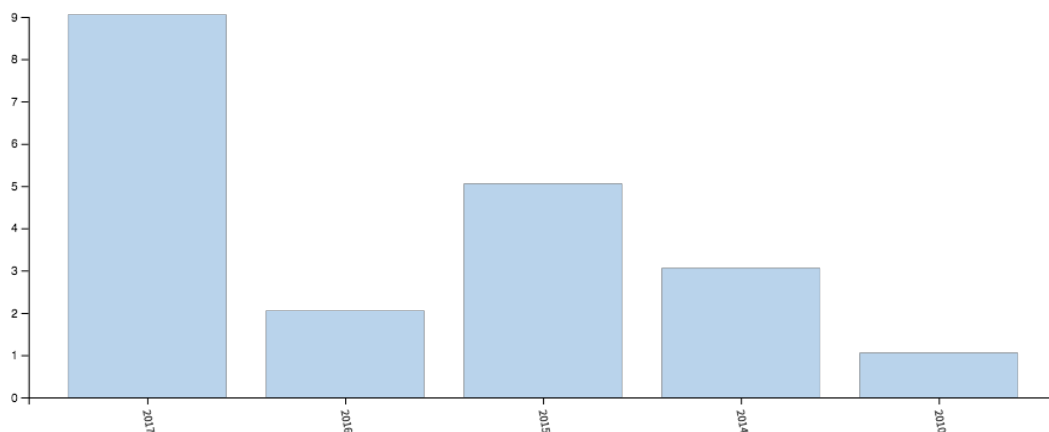


Graphic 2 – Distribution of scientific production in the past 10 years (string 2)

Journal articles dominate these results (7). Geographically, Europe (England, Netherlands, Spain, Cyprus, Sweden - 7 affiliations) also leads in this combination that includes the term MOOC, followed by the USA (2 affiliations). As known, the MOOC being a relatively recent topic is expected that production will increase and diversify.

### 3.3 Search 3: online learning AND higher education AND video AND distance learning

This search resulted in 18 publications. A high number is observed in 2017, 7 publications, followed by 5 in 2015, 3 in 2014, 2 in 2016 and just 1 in 2010. From this, we deduce that distance learning gained importance in the universe of higher education which, in some way, confirms the observable trends of the migration of presential systems to distance systems in formal education.



Graphic 3 – Distribution of scientific production in the past 10 years (string 3).

Journal publication continues to dominate production: 18 publications.

In terms of the geographical origin of the authors' affiliations, Europe leads production (10): Sweden (3), Netherlands (2), England (2), Cyprus (1), Romania (1), Turkey (1). However, in strict country terms, there is a predominance of the production of authors with affiliations originating in the USA (5) in relation to all the other countries: South Africa (3), People's Republic of China (2), Taiwan/Republic of China (1), Australia (1), Indonesia (1), Kenya (1), Singapore (1), Tanzania (1). The 18 articles include 26 authors with different affiliations.

## 4 CONCLUSIONS

This work is, as stated, exploratory. There are several limitations that, now that they were identified, will serve as a basis for future work that has already begun.

The first limitation is found in the Web of Science, when it privileges the (dominant) English language. We know from direct contact that there are numerous publications - credible and peer reviewed - on these topics in other languages, namely in French, Portuguese and Spanish, as well as in journals, conferences and books; the Web of Science does not include the SCOPUS database, for example. It also presents some accounting errors from which the publication selection protocol for analysis should account for.

On the other hand, the selection of keywords is also problematic given that there are several synonyms for the same topics and the available thesaurus does not solve this problem. Last but not least, refining by Open Access drastically reduces the results and therefore we include them in Table 1: there are 96 open access publications compared to 820 in the total number of both systems (open and paid). Our choice for Open Access stems from the fact that we work in public non-profit institutions, funded by public funds. From here we know that the result of our scientific work must be available to anyone and free of charge. In addition, our area of work is education (and research in education) which, as expressed in the Universal Declaration of Human Rights (Art. 26), should be accessible to all people. However, we are aware that the editorial work has high costs and that in Open Access the means are scarce.

As a future work, a detailed analysis of the publications found in this research (with its analysis protocol) and other bibliometric revisions with more accurate search strings is underway.

In summary, since New Literacies are new social practices resulting from the use of technological (digital) communication artifacts/devices, supported by cloud computing, it is important to identify and problematize the place of the audiovisual of educational intention (cinema/educational video) at its intersection with new online, formal learning, situated in the higher education universe (Figure 1).

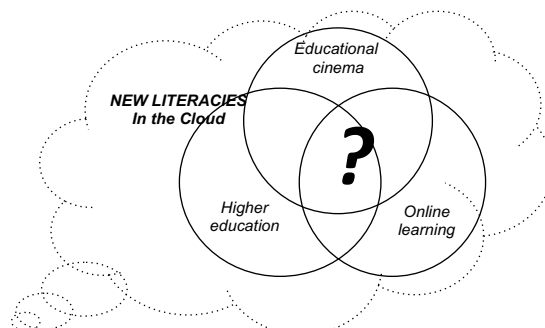


Figure 1. At the intersection of educational cinema, online learning and university education.

That is, the present work only introduces a line of investigation that intends to know what videos are used for in these new devices online, what characteristics do they present, who produces them and for what purposes? After all, what has changed (or what can be changed) in the "new" uses given to the educational audiovisual?

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## REFERENCES

- [1] C. Lankshear and M. Knobel, *New Literacies: everyday practices & Classroom Learning*, Open University Press/MacGraw-Hill, 2008.
- [2] L. Lattanzio, *Les Média Éducatifs au Japon*. PUF, 2003.
- [3] L. R. Oliveira, "Cinema educativo e construção social da realidade: criando identidades através da leitura e da escrita do mundo com o audiovisual", *Atas do X Congresso Internacional Galego-Português de Psicopedagogia*, Universidade do Minho, pp. 5570-5582, 2009, <http://hdl.handle.net/1822/9855>.
- [4] JOCE, Jornal Oficial das Comunidades Europeias de 27.7.2002. *Convite à Apresentação de Propostas DG EAC/46/02. Acções preparatórias e inovadoras 2002/b. e-Learning (2002/C 179/07), C 179/14-C 179/20*, 2002, retrieved from <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:179:0014:0020:PT:PDF>, 9 January 2019.
- [5] L. R. Oliveira, "A Model for an Open, Flexible Website to Aid Classes at University: the Student Interface", *Proceedings of E-Learn 2002--World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*, 2002, pp. 2001–2004, retrieved from <https://www.learntechlib.org/primary/p/9408/>, January 9, 2019.
- [6] J. Daniel, "Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility", *Journal of Interactive Media in Education*, vol. 2012, issue 3, p. Art.18, <http://doi.org/10.5334/2012-18>.
- [7] S. Downes, Stephen Downes Blog, *The Rise of MOOCs*, 2012, retrieved from <https://www.downes.ca/cgi-bin/page.cgi?post=57911>, January 9, 2019.

- [8] L. R. Oliveira and S. Gomes, "MOOC: de onde vêm e para onde vão", *Atas do XII Congresso Galego-Português de Psicopedagogia*, Universidade do Minho, 2013, pp. 6482-6494, retrieved from <http://webs.ie.uminho.pt/xiigp/at13.pdf>, January 9, 2019.
- [9] A. Hansch, L. Hillers, K. McConachie, C. Newman, T. Schildhauer and J. P. Schmidt, SSRN e-library, HIG Discussion Paper Series No. 2015-02, *Video and Online Learning: Critical Reflections and Findings from the Field*, 2015, retrieved from <http://dx.doi.org/10.2139/ssrn.2577882>, January 9, 2019.
- [10] D. Peraya and B. Poellhuber, "L'apprentissage médiatisé des dispositifs de type podcast aux dispositifs de type MOOC: du micro au macro au méso", *Revue internationale des technologies en pédagogie universitaire*, vol. 13, no. 2-3, 2016. <https://doi.org/10.18162/ritpu-2016-v13n23-01>.
- [11] D. Peraya, "Au centre des MOOC, les capsules vidéo: un renouveau de la télévision éducative?" *Distances et Médiations des Savoirs*, vol 17, 2017, retrieved from <http://journals.openedition.org/dms/1738>, January 9, 2019.
- [12] L. Bufrem and Y. Prates, "O saber científico registrado e as práticas de mensuração da informação", *Ciência da Informação*, vol. 34, no. 2, pp. 9-25, 2005, <http://dx.doi.org/10.1590/S0100-19652005000200002>.
- [13] A. Pritchard, "Statistical bibliography or bibliometrics", *Journal of Documentation*, vol. 25, no. 4, pp. 348-349, 1969.
- [14] A. R. Martins, S. Monteiro, J. Caldeira Duarte and L. R. Oliveira, "Games and Learning – a Bibliometric Analysis of the Scientific Production", *ICERI2015 Proceedings*. Pp. 1909-1916, 2015, <http://hdl.handle.net/1822/56231>.