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IDENTIFICATION OF THE OFFER FOR MOOC-TYPE COURSES IN THE FIELD OF SUSTAINABLE DEVELOPMENT: COMPARATIVE ANALYSIS BETWEEN SOCIAL MEDIA AND DOCUMENTARY RESULTS[*]

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Abstract

Massive Open Online Courses (and their variants) have managed to spread throughout the world, becoming the new promoters of changes in human relations, with the aim of establishing the starting point for the creation of courses under this approach in the field of sustainable development. In this paper, a documentary analysis is carried out under the PRISMA methodology and the NVivo software, which is compared to a social media analysis carried out with the KNIME software, the fields most frequently addressed are identified. As conclusion, the objectives of sustainable development related to climate change and the environment have been the focus in the design of this type of courses.

Keywords: environment, KNIME, MOOC, NVivo, PRISMA, sustainability, sustainable development

1. Introduction

The characteristics of the training process have been questioned as technology permeates societies. The limitations of physical space or the number of students, including those of communication and interaction caused by the need for a synchronous encounter (Bindé et al., 2005), may remain in the past if it is recognized that technological developments revolutionize the dynamics of societies to as they become massive. For example, the invention of the *printing press* allowed books to spread throughout the world, definitively changing access to knowledge. The *steam engine* accelerated economic development and laid the foundations for the industrial revolution. The development of the

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mp3 format, combined with easy access to the internet, forced the music industry to rethink its business model (Ku, 2002).

Currently, Massive Open Online (MOOC) courses (and their variants) have managed to expand to all corners of the world, becoming the new promoters of changes in human relations, creating the basis for a new revolution, according to (West, 2012): teachers' access to information and communication technologies (ICT) has been limited - and often non-existent - in communities facing the most pressing educational challenges. However, this situation has been changing, today there are 5.9 billion mobile phone subscriptions worldwide, thanks to the rapid decline in costs. Even in areas where computers and teacher training institutions are scarce, mobile phones are common and, in most cases, teachers have the basic knowledge to use them. This fact, added to increasingly faster connections, provide an ideal setting to leave behind the limitations of physical spaces, aspects of schedules or numbers of students. In addition to allowing interaction and communication that transcends the classroom, it becomes a continuous and permanent process. (García Arango et al., 2020)

These characteristics facilitate the achievement of the sustainable development objectives set by the United Nations, specifically allow a massive and quality diffusion, a democratization of knowledge that helps to close the digital gap that prevents breaking with the cycles of poverty (United Nations, 2018).

2. Contextualization and methods

Training through MOOC-type courses is presented to educational actors as the possibility of having ubiquitous learning environments, leaving behind the need to meet at a suitable place and time. According to (Shuler et al., 2013): for the large number of young people and adults who cannot follow formal schooling or instruction due to social, economic or other reasons, the use of mobile devices to expand the educational experience is highly advantageous: it opens new channels for learning without closing to some that already exist.

In this sense, learning mediated by these dynamics contributes to increase the educational coverage in a country (García Arango et al., 2019). And this is an opportunity to widely and massively distribute topics of high value for today's society, while escaping the formality of the classroom. Among that topics there are those raised by the United Nations, the SDGs.

Currently, the scope of the Sustainable Development Goals (SDG) has been affected by the pandemic generated by SARS-COVID-19, the following aspects stand out (United Nations, 2020). Fig. 1 demonstrates the main scope of SDG Report 2020.

Fig. 1. The main points of the Sustainable Development Goals Report. Adopted form (United Nations, 2020)

In this context, the present text seeks to carry out a documentary and social media search, which serves as the basis for the creation of MOOC-type courses, in order to help to positively impact the objectives of sustainable development.

2.1. Methodology

A systematic review was carried out, in order to identify and evaluate articles that propose possible implementations of MOOC-type courses in the field of sustainable development. PRISMA approach was used (Liberati et al., 2009). PRISMA is an abbreviation of "Preferred Reporting of Items for Systematic Reviews and Meta-Analysis" for the systematic review of the available literature. This approach is based on two criteria checklist (Search string below), and a four-phase flow chart – Fig. 2.

("Sustainable development" AND "MOOC") AND ("MOOOC" OR "sustdev")

This approach allows us to identify the relevant literature on the offer of MOOC-type courses in the field of sustainable development.

We are considered articles and research result books of the last 5 years, published in indexed journals *(Science Direct, SpringerLink* and *Google Scholar)*. In addition, those papers that did not refer to mediation processes through MOOC-type courses were excluded.

All the abstracts of the articles (n = 524) were reviewed emphasizing the methodological and classification aspects of the study object. Considering the search terms in the search string above, the different filters detailed in Fig. 2 were used, created according to the PRISMA (Liberati et al., 2009).
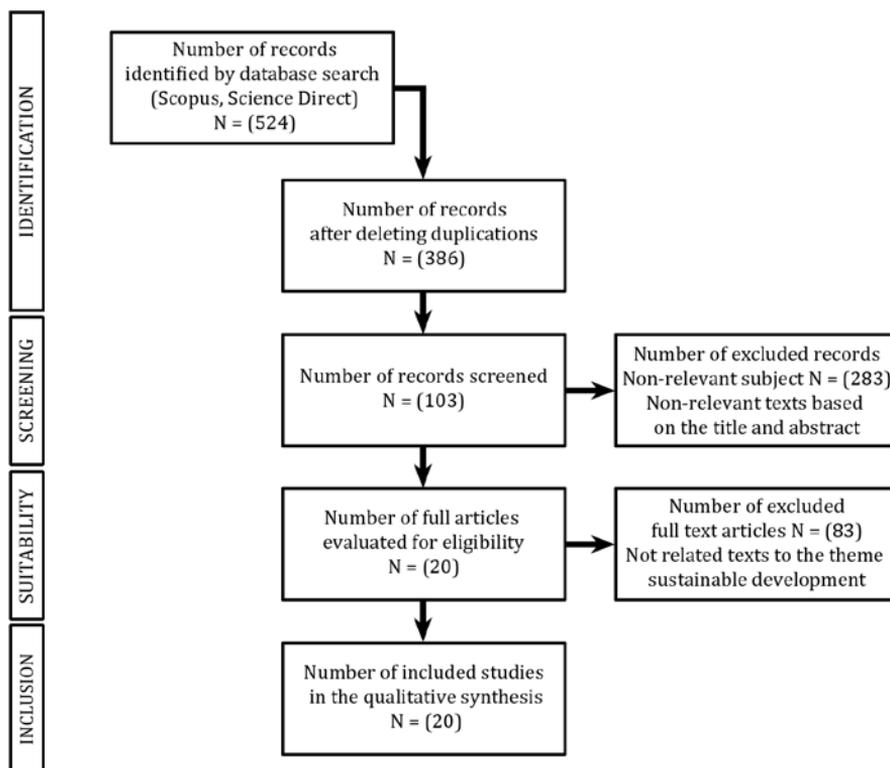

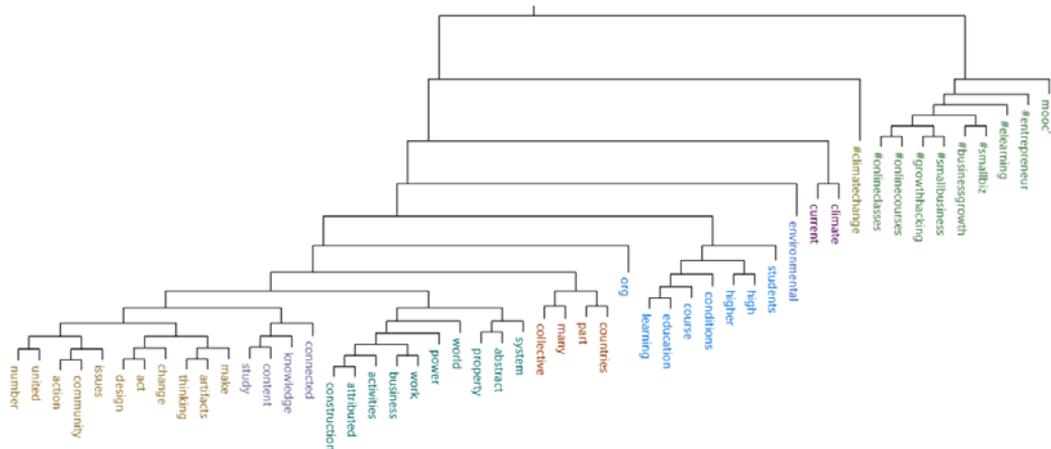**Fig. 2.** Processing of selected papers with PRISMA

Along with the documentary search, a data extraction is carried out with the application of data mining techniques using the software NVivo (Bazeley, 2007) and KNIME (Berthold et al., 2009). Social networks Facebook and Twitter were used for data mining. The procedure consisted of connecting to abovementioned networks through the APIs and subsequent search for posts related to Sustainable development and MOOC.

3. Results

3.1. Documentary review

After carrying out the selection of the 20 texts of the papers (Fig. 2, Inclusion stage), a review is made of the categories they address, finding that the papers do not develop the concept of evaluation in depth. As can be seen in Fig. 3, the evaluation category has no impact on the word cloud.

Fig. 3. Word Cloud for documentary review

Fig. 4 shows how the analysis of conglomerates, with 100 categories, highlights the proximity of the concept of sustainability with that of climate change and less impact on issues associated with energy.

The low presence of categories related to the educational field stands out; the central ramifications contribute to aspects of climate change, showing an offer focused on this topic.

3.2. Social media review

In the word cloud generated from the search results extracted from social networks Twitter and Facebook, the environmental issue stands out among the 500 most mentioned in the discussion of MOOC-type courses, the topic of climate change is less prominent compared with his strength in the documentary review. The word cloud from social networks is presented in Fig. 5.

Fig. 4. Conglomerates analysis

Fig. 5. Word Cloud generated from social media search results

As one can see, the analysis of clusters for the 50 most frequent topics shows again the relationship of the topic of climate change with MOOC-type courses; the emergence of discussions around marketing stands out, dominating over topics as important as the environment. Fig. 6 reveals the analysis results.

Fig. 6. Most frequent topics clustering

4. Conclusion

The analysis carried out in both contexts: Documentary and Social Networks, allows us to clearly identify that there are some dominant themes in terms of academic production and discussion of the general public around MOOC-type courses in the context of sustainable development.

Climate Change is one of them, accompanied by aspects related to the Environment and Marketing.

Due to the broad framework of action of the Sustainable Development Goals, the appearance of themes such as entrepreneurship is inevitable.

From this analysis it is possible to identify the need to design MOOC-type courses that target other than Sustainable Development Goals, such as:

- Gender equality;
- Submarine life;
- Peace, Justice and Social Institutions;
- Sustainable Cities and Communities.

In general, it is highly valuable to create MOOC-type courses that can be used on all types of devices, targeting each of the Sustainable Development Goals, as already mentioned.

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