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Systematic Document Research on Open Educational Resources

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Abstract
According to UNESCO (2002) [8], open educational resources are teaching, learning and research materials in any digital or other medium that are in the public domain or have been released under an open, non-public license. restrict free access, use, modification and distribution by others. Using open educational resources has become an essential need for universities. This article aims to evaluate research trends on open educational resources in businesses based on documents in the Openalex database in the period from 2013 - 2023. Research results show that the topic "Open educational resources" is of great interest to researchers around the world. The results from the article aim to supplement the literature on different methods and contexts to support future researchers of open educational resources.

1. Introduction
With the trend of improving the quality of education, the application of interactive and open access methods is also an essential part to help the teaching and learning process achieve high efficiency. Access to knowledge and information sources is becoming more and more urgent, and interest in how to find, use, knowledge, create and disseminate knowledge is increasing. With support from the Internet and open source software, sharing information resources and exchanging knowledge has become much more convenient and is gradually becoming a mainstream trend in today's education system. grand. There have been many studies in many different countries about open educational resources. Therefore, in this study, it helps readers grasp the development and information quality of the current status of "open educational resources" through the frequency of keyword use, number of citations, and quantity of information. Authors and co-authors are cited over time. At the same time, it helps future researchers know the trends of this topic over time.

The article clarifies the following contents: What is the number of articles related to open educational resources in businesses from 2013 to 2023? What topics are the keywords grouped into? Which authors and which countries are influential and have published many publications on this content?

To answer the above questions, the study reviewed 642 articles published in the period 2013-2023. Research conducted through bibliometric analysis makes a great contribution to the research community because through bibliometrics, a valuable amount of information can be collected about a topic. By reflecting on what has been done and what needs future research, the article aims to add to the literature on different methods and contexts to support researchers of open educational resources.

2. Literature Review
Teaching, learning, and research materials in any digital or other medium that are in the public domain or that have been distributed under an open license, which does not limit others from accessing, using, altering, and sharing freely, are considered open educational resources, according to UNESCO (2002) [8]. Tools, content, and implementation resources are all included in Huang's (2015) list of open educational resources. Open source software is used to create, use, and distribute tools. Content consists of study and research materials. Technology standards and implementation licenses are examples of implementation resources. According to the Hewlett Foundation, open educational resources are resources for teaching, learning and research that exist in the public domain/public domain (public use) or are circulated under an intellectual property license that allows use free and repurposed by others. Open educational resources include all the science, learning materials, modules, textbooks, tests, software and other tools, documents and technologies used to support education access to

knowledge. Open licensing acknowledges the work's originality and operates within the bounds of applicable intellectual property rights as established by relevant international conventions. In addition, governments everywhere are urged by UNESCO to publicly support and license instructional content for public use. This proclamation is regarded as a major turning point in the history of the effort to create open educational materials.

The capacity of open educational resources is determined in five aspects: The capacity to become familiar with open educational resources, the capacity to search for open educational resources, the capacity to use open educational resources, and the capacity to share open educational resources. According to Bliss and Smith (2017) [2], a document classified as an open educational resource must meet all 5 rights: Retain (allowed to retain for use, without restriction on digital management rights), Reuse (this is the most basic principle and openness. Everyone can use the document for different purposes), Revise (is allowed to customize, modify, change), Remix (allowed to mix two or more resources into a new resource), Redistribution (allowed to share documents with everyone). The term Open Educational Resources is not synonymous with online learning (E-Learning) or flexible learning (mobile learning). Open educational resources can be shared digitally or can be as printed documents.

Technology played a major role in the creation and development of open educational resources (OER), which are reliant on it, particularly the Internet. OER benefits greatly from technology as it provides knowledge that is accessible to all and can be readily shared and utilized. Technology helps create, store and share the content of open educational resources. However, this is open source technology so the community can contribute and develop. An open educational resource document must be in an open format so that it can be modified and updated to create derivative versions, as well as be able to be used on different technology platforms. In order for open educational resources to be accessible to users with varying technological setups and situations, open technology standards must be established. According to respondents, the technology component has an average influence, with 40.7% stating that it is important. In fact, among the two elements of OER, content and technology, content is the most difficult problem.

According to Col (2011) [3], open educational resources in universities include the benefits of sharing and cooperation between organizations, between countries and creating new educational models. Universities that wish to use open educational resources must have an information system in place for handling these resources. Universities' open educational resource management information system ought to be viewed as an educational information system channel, interacting with other information technology application systems across a range of organizational, managerial, and technological domains. Many universities are incorporating information and communication technology into their management and operations to serve students learning more effectively, reduce costs and to prepare them for work in the workplace. However, in many developing countries, investment in information technology such as hardware, software and Internet connection to access open educational resources is still a challenge. Therefore, it is urgent to readjust pedagogical methods in the field of teaching and learning materials to suit the open environment while still ensuring high quality training and appropriate educational opportunities.

3. Method
This study used the SLR systematic review method of Tranfield et al. (2003) [7]. Sample selection for the study was based on PRISMA (priority items for systematic reviews and meta-analyses) originally proposed by Liberati et al. (2009) [5] and updated in 2021 by Page et al. (2021) [6].

First, the author started by selecting a database to collect articles to include in the study. The database chosen is OpenAlex, known as a free database, connecting data points to create a comprehensive, interconnected database of scientific research systems. Global learning. Data was collected on March 4, 2024, with the use of the following keywords "Open Educational Resources" or "OER". In the data filtering field, the author chooses to filter keywords by "Title and abstract". The author chose the search period from 2013-2023 and searched in the form of "open access". In the Topic section, the author selects "Open Educational Resources and Learning Object Repositories". As a result, there were 642 documents with the keywords "Open educational resources" or "OER" in the title and abstract published in the period from 2013-2023.

In the second step, the author screened to remove inappropriate documents through technical screening and content screening. For technical screening, documents of the following types: Paratest, book-chapter, book, and thesis will be eliminated by deselecting. For content screening, documents are pre-read to remove documents with irrelevant content even though they contain search keywords. The results after filtering showed that all 642 results met the filtering conditions for inclusion in the study. The remaining number of documents after the two steps is analyzed as a whole in the SLR document system and entered into VosViewer software to analyze keywords and co-citation analysis. The results of SLR analysis are presented in tables and graphs. From the analysis results, the study finds popular research directions, names the research directions, and suggests further research directions related to the topic of Open Educational Resources.

4. Result
Statistics on year of publication
From 2013 - 2023 there were a total of 642 open educational resource articles indexed in Openalex with an average of 58 articles published per year. The number of articles has gradually increased in recent years. 2016 is the year with the lowest number of articles published with 35 articles. 2020 is the year with the highest number of articles published with 92 articles. From the statistical results of publication frequency each year, it shows that authors are having a strong interest in the topic of open educational resources.
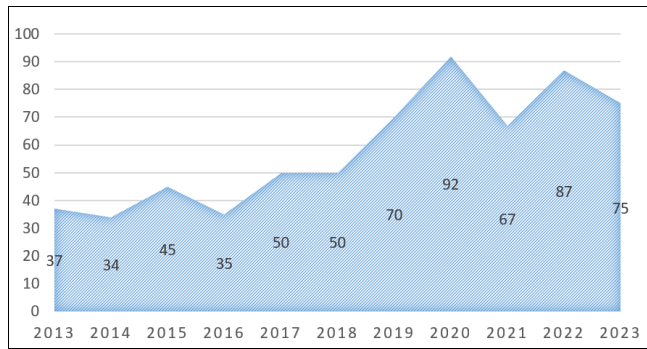
Fig 1: Chart of number of publications and citations by year

Keyword analysis results

To answer the question, on the topic of open educational resources, what content is of interest to researchers, the author learns about keywords that appear frequently in published publications. Among the 767 keywords that appeared, the study selected keywords that appeared 90 times or more, and there were 20 keywords that met this condition. Keywords are evaluated by Vosviewer software based on the number of occurrences and total link strength. The group of keywords that appear 90 times or more is shown in Fig 1. According to Fig 1, there are 20 keywords divided into 3 groups, with 190 links and total link strength of 17921. Group 1 is represented by red lines, with 7 keywords, shown through 19 links, and the frequency of these keywords is 260. Group 2 is represented by green lines, with 7 keywords, shown through 19 links, and the appearance intensity of these keywords is 324. Group 3 is represented by blue lines, with 6 keywords, represented by 19 links, and the appearance intensity of these keywords is 324.
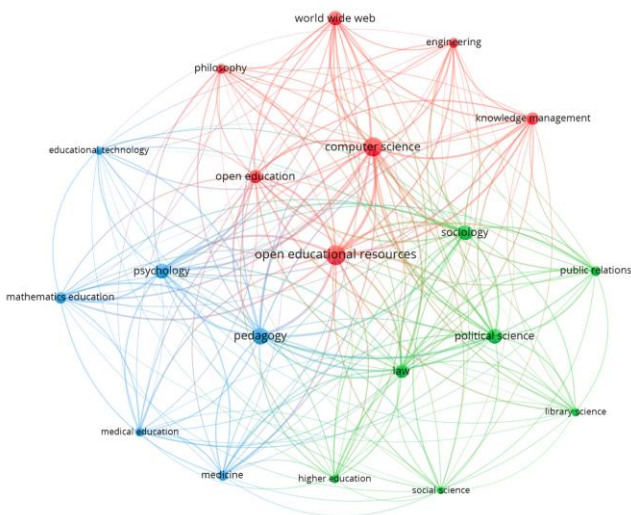
Fig 2: Keyword analysis results

Co-authorship analysis

To explore the trend of collaboration in research on open educational resources, this study analyzed co-authorship relationships between individual authors and between organizations. According to Benoit *et al.* (2018) [1], the analysis results help improve understanding of research collaboration and help discover influential researchers. In the period from 2013 to 2023, there were 1,208 authors

participating in writing on the topic of open educational resources. Among them, there are 6 authors appearing 8 times or more, the results are shown in Table 1. Author John Hilton has 14 articles on the topic of open educational resources, and is the author with the largest number of articles.

Table 1: Results of author analysis

S. No	Author	Documents	Citations	Total link strength
1	David Wiley	11	544	10
2	John Hilton	14	863	8
3	Daniel Burgos	8	257	2
4	Robert Farrow	9	136	2
5	Daniel Otto	8	74	0
6	Hengtao Tang	9	108	0

Country analysis with article on open educational resources

The author also conducted research on the countries with the most articles on this topic. This result is shown in Table 2. In all, 80 countries have authors publishing articles related to open educational resources. The 9 countries with the most articles about open educational resources are Spain, Canada, China, United States, United Kingdom, Germany, South Africa, Australia, and Brazil. Among them, the United States is the country with the most articles with 209 articles on open educational resources, equivalent to 2200 citations, and a total link strength of 23.

Table 2: Results of country analysis

S. No	Country	Documents	Citations	Total link strength
1	Spain	31	510	29
2	Canada	33	353	25
3	China	19	320	25
4	United States	209	2200	23
5	United Kingdom	54	969	28
6	Germany	42	349	16
7	South Africa	19	229	14
8	Australia	15	150	11
9	Brazil	17	119	11

Institutional Analysis has articles on open educational resources

Table 3 shows the organizations (universities) with many publications on open educational resources in the period 2013-2023. According to statistical results, there are 538 organizations with authors participating in writing articles about open educational resources. Fig 3 shows the level of collaboration between institutions on articles related to open educational resources. There are a total of 9 organizations grouped into 3 groups with a total link of 20, and total link strength of 35..
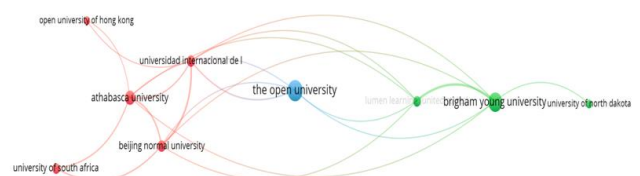

Fig 3: Results of cooperation between organizations

Organizations with authors contributing the most articles, counting 9 articles or more, include: Beijing normal University, Universidad internacional de la rioja, Athabasca University, The Open University, Brigham Young University, and University of Duisburg-Essen.

Table 3: Results of organizational analysis

S. No	Organization	Documents	Citations	Total link strength
1	Beijing normal University	9	270	10
2	Universidad internacional de la rioja	9	262	10
3	Athabasca University	12	168	7
4	The Open University	28	278	5
5	Brigham Young University	24	1041	4
6	University of Duisburg-Essen	12	87	0

Source: Author compiled research

5. Conclusion
In this study, to provide detailed information on the number of publications, publishing journals, keyword networks and co-authorship networks related to the topic "open educational resources", we evaluated Global publication price of open educational resources indexed in the Openalex database published between 2013 and 2023. This study used bibliometric methods with the help of several statistical and data visualization applications to explore research trends in open educational resource content.

Research results show that a total of 642 articles on open educational resources in business were indexed in Openalex from 2013 to 2023, an average of 58 articles published per year. Among the 767 keywords appearing, there are 20 keywords appearing 90 times or more. In the period from 2013 to 2023, there were 1,208 authors participating in writing on the topic of open educational resources. Author John Hilton has 14 articles on the topic of open educational resources, and is the author with the largest number of articles. In all, 80 countries publish articles related to open educational resources. United States is the country with the most articles with 209 articles on open educational resources, equivalent to 2200 citations, and a total link strength of 23.

The research results have contributed to the general theoretical basis, serving as a basis for reference studies on open educational resources in businesses. Data collected from richer sources such as Scopus or Web of Science are suggestions for further research on open educational resources.

6. References
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