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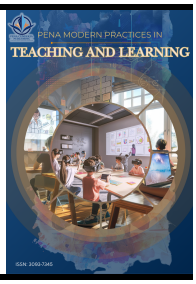

MOOC in Higher Education: A Review and Bibliometric Analysis

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ABSTRACT

This study explains all the factors related to the definition and current research trends on how MOOCs can improve education. This study aims to highlight collaboration between authors, and countries in the field, to identify authors; to find out the research topics that researchers have been working on in recent years. Bibliometric and theoretical analysis based on the Google Scholar database from 2018-2022 was used. Search results found 710 articles with the keyword "Open Online Course". The data obtained then displays a total of 1435 authors who wrote at least 1 article, comprehensively in 82 clusters. Field terms are taken based on the title and abstract, while the method used to calculate the dataset is full counting. Co-occurrence analysis revealed that there were 2162 keywords which were then grouped into 204 clusters or groups where there were some occurrences that were more prominent than others. Based on the results of the VOS Viewer analysis, 11 terms were chosen because they have a large occurrence value and a high level of relevance. Several keywords in publications published in 2022 include "digital learning platform", "higher technology", "behavioral tools", and "literacy"

1. Introduction

Education is greatly influenced by the progressive introduction of information. Technologies in our everyday lives, including in education, digital technologies have become more critical and even essential in updating individuals' knowledge and skills and increasing their lifelong learning potential. Many courses are organized today to boost lifelong learning potential [36]. Teknologi dan komunikasi (TIK), resulting in the design and build of e-learning, or smart learning environments (SLEs) on a global scale for educational technology. The extensive and continuous digitalization of our everyday life poses numerous challenges for the society, including education of the young generation. Indeed, digitalization in basic education is currently a hot topic among a number of disciplines and research communities [25]. Users (or controllers) of technologies can and do circumvent technologies, ignoring or shutting out certain components of them, working around them, or inventing new elements. When faced with an educational technology that limits them, users may employ certain

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tactics to circumvent or surmount the limitations imposed by the technology [6]. Countries faced many challenges in integrating technology into their education system. The integration of information and communication technologies (ICTs) into the education environment involves multiple factors of an administrative, organizational, professional, and socioeconomic nature [5]. This is mainly because of the growth, development and accessibility of the internet and technology. Higher education institutions have responded to this transition by embracing the internet and technology through multimodal methods of teaching, learning and research [41]. One educational approach, which is also based on using educational technologies, that could facilitate incorporating 21st-century skills or key competences into teaching and learning [56]. In education, innovation can appear as a new pedagogic theory, methodological approach, teaching technique, instructional tool, learning process, or institutional structure that, when implemented, produces a significant change in teaching and learning, which leads to better student learning. So, innovations in education are intended to raise productivity and efficiency of learning and/or improve learning quality. For example, Khan's Academy and MOOCs have opened new, practically unlimited opportunities for massive, more efficient learning [44]. Any sort of innovation in education will lead to an increase in productivity, efficiency and enhancement in the overall quality of education. However, successful implementation of an educational innovation, requires active involvement and support of all stakeholders: students, parents, teachers, academic administrators, researchers and policy makers [13].

E-learning is electronic learning that uses modern multimedia internet technology. Global education has over many years exploited advances in information and communication technology to plan for a staged transition from traditional models to e-learning. In developed economies, e-learning has become an alternative but key channel of instructional delivery in higher education institutions [35]. The new learning platforms such as mobile-learning (m-learning) and blended learning (b-learning) took time to be adopted by higher learning institutions in developing economies [34]. Technology to enhance the learning experience, or the quality of learning by providing educated learners with easy access to resources and services on the one hand, and by facilitating remote exchange and collaboration on the other hand. Globally, the Internet revolution has made online learning a popular option to face-to-face learning in recent years. Increases in Internet access throughout the world are widely seen as a key factor that fueled the e-learning technology sector. E-learning technology refers to a wide variety of communication, information and associated technologies that enhance teaching, learning and assessment [15]. From this perspective, e-learning consists of two major phases (1) content development, and (2) content delivery and maintenance. Content development includes planning, design, creation, and evaluation, which in turn leads to content delivery and maintenance [31]. E-learning promotes self-education, and with the availability of small and smart schools, it works well. Students are not restricted to gain knowledge within their domestic boundaries; they can now attend sessions across the nation with the help of the Internet [16]. In this situation, students can attend lectures with real-time interaction from professors or instructors and receive immediate feedback [17]. This specifically helps learners who are socially inept or do not have physical access to meet people in person, or to engage and interact physically with others to learn. e-learning is not just about web- based learning. There are multiple facets of e-learning; these include mobile learning with smartphones, tablets and other equipment. The term e-learning also includes a wide range of activities such as computer-based training and instruction, and education delivered online [27,37]. Online learning is viewed as one of the effective instruments for widening access and providing flexibility for continuous professional development and lifelong learning. Student learning success poses a constant challenge to open and distance education institutions [59].

MOOCs are open online courses that generally allow anyone to register and take the course at no cost (at least for basic courses). Thus, new innovative ways of learning are evolving in the present scenario and massive open online courses (MOOCs) or online learning is one such innovative method. It provides flexible ways of teaching and learning [7]. The emergence of new and modern educational interventions such as Open Educational Resources (OERs) and MOOCs has provided certain innovative prototypes of education for the knowledge-hungry people. But, this also necessitates a study on the differences in the adoption and implementation of online delivery of educational contents in both the developed and developing countries solely on the basis of their utility and success rate [8]. The audience, i.e. the participants, is the most crucial player when it comes to course concepts. The teacher can neither predict the number of participants that attend a MOOC nor their social, economic or geographical background, and when thinking of a specific target group during the conceptual phase the teacher cannot be sure that the attending audience will match the fictive target MOOCs feature openness and scalability. Most of the courses are open for learners to enrol in for free and have a vast number of students. This makes infeasible many teaching methods commonly used in conventional face-to-face or distance learning contexts [58]. Further, MOOCs are a modern education innovation which can be used for distance learning. They also noted that it is a part of the blended teaching model in which learning takes place in both face-to-face and online settings [1]. Open e-learning platforms such as massive open online courses (MOOCs) are an increasingly prevalent medium of education and training delivery in which information, knowledge and instruction are openly disseminated through online media to diverse user groups [28]. Along with conventional education, open education has widened the scope of learning opportunities through the emerging theme of “Bring your own device” to learn. Besides, open educational resources (OERs) and massive open online courses (MOOCs), some other digital learning platforms such as online meetings apps like Zoom, Google Meet, Cisco WebEx, etc. have provided myriad learning opportunities to the learners by opening up their minds and helping them to gain need-based training and skills which are the most essential prerequisites for a healthy living in a society [9]. The MOOC should be designed so as to be easily adopted for blended learning within an institution, to be used both as instructor-led over a defined time period and also as “any-time self-paced”. It should also be hospitable to self-study and to participants wishing to “drop in” to examine sections of the material [14]. In fact, each MOOCs platform is a large-scale “knowledge base” where the educational resources can be regarded as the outcome of crowd intelligence (from both instructors and learners). However, those resources are unstructured and diverse [26]. MOOCs have benefited tens of millions of students all over the world. However, when learners are faced with those massive courses, they often need to spend much time looking for the course they really like. It also happens in other similar situations in the age when resources are increasing exponentially [55].

As this pandemic has brought some fundamental changes in global education and mode of learning. During the pandemic, MOOCs based on self-directed learning (SDL) became very popular for skill development, especially among the youth. To sustain the continuity of business activities and operations, organizations had to move toward digital approaches during COVID-19. Consequently, communication, support services, human resource operations, including recruitment, compensation and benefits and employee training and development programs, have gone through a radical transformation [47]. Global massive open online course (MOOC) platforms like Coursera, Edx, Udemy, etc. made thousands of fundamental skills courses completely free of cost during this tough time and also provided financial aid to the learners [46]. Therefore, some educators conceived the brilliant idea of massive open online courses (MOOCs) to provide meaningful learning experience to anyone around the globe for free [2]. MOOCs potentially interrupt many of existing conventions and assumptions of formal education, both in offline and online modes of delivery. Their unique features

are challenging the parameters of learning and even education, raise new questions about their purposes and the roles that they can play in lifelong learning perspectives [43]. MOOC is a web-based online course with no limit on the number of participants held by professionals or other experts. MOOC is not just a normal online course, it is an open, participatory and distributed study program where work is shared among participants to create a lifelong and worldwide network of knowledge. Regarding MOOCs' distinctive features, they are quite similar to classrooms as they both have starting/completion dates and follow assessment methods. their most significant characteristic is their free access, as anyone can participate deciding the nature of such participation according to their needs and interests. MOOC characteristics are: 1) Autonomous informal learning regulated by the participant; 2) Distributed knowledge and learning from the process of exploration and analysis of knowledge and its connections; and 3) Participants generate, share, interpret and combine knowledge. These actions are part of the same learning.

To date, there is minimal available data that has examined MOOCs considering all those barriers to make learning more accessible [54]. every researcher, both new and old, needs to know what the research trends are, which journals publish more publications in their field, which countries and universities are involved in research, which have the most influential papers worth reading, which are the best collaborations between the country, university or researcher who is the reference for the researcher must be followed, what is the evolution of this field over the years. A mathematical overview of related studies is necessary for a comprehensive understanding of this large and diverse field of research. Our research adopts a bibliometric approach to analyze relevant scientific publications published between 2018 and 2022, to reveal key research themes and influential entities in the field. The following sections are as follows: related works, research methodology, data analysis, interpretation of the results obtained, followed by a discussion of the results and conclusions.

Table 1
Previous studies of bibliometric analysis in e-learning

No	Discussion Topics	Educational Contribution	Year	References
1	Research on E-Learning in the Workplace 2000-2012: A Bibliometric Analysis of the Literature Bo	e-learning for continuing education and professional development, e-learning in the healthcare sector (as one of the most prolific e-learning initiatives), use of social media for e-learning, and the integration of knowledge management with e-learning.	2000-2012	(Cheng *et al*.,[12])
2	Exploring two decades of research on classroom dialogue by using bibliometric analysis	This work is useful in terms of indicating the current status of research to scholars as well as practitioners, enabling them to be more aware of the research hotspots when making decisions about which topic to address.	1999-2018	(Song *et al*., [50])
3	Bibliometric mapping of mobile learning	This study aims to reveal the tendency towards	2015–2019	(Goksu, [19])

No	Discussion Topics	Educational Contribution	Year	References
		research in the field of mobile learning with the analysis of co-authorship, bibliographic coupling, co-occurrence, and citation by taking into consideration of author, publication, keyword, journal, country, university and citation variables.		
4	Global analysis of the E-learning scientific domain: a declining category?	The method used in this study is a contribution to bibliometric techniques to explain the behavior of scientific production in a certain area of knowledge.	2003–2015	(Tibaná-Herrera, Fernández-Bajón, & de Moya-Anegón, [51)
5	Categorization of E-learning as an emerging discipline in the world publication system: a bibliometric study in SCOPUS	This set serves as a channel of scientific communication and structure of knowledge on the thematic and can therefore be considered as the basis for establishing the “e-learning” thematic category in the world system of scientific publications, contributing to the consolidation of the discipline, to its access and development by researchers.	2012-2014	(Tibaná-Herrera, Fernández-Bajón, & De Moya-Anegón, [51])
6	Past, present, and future of smart learning: a topic-based bibliometric analysis	Innovative information and communication technologies have reformed higher educa-tion from the traditional way to smart learning. Smart learning applies technological and social developments and facilitates effective personalized learning with innovative technologies, especially smart devices and online technologies.		(Chen *et a*l., [11])
7	Fifty years of British Journal of Educational Technology: A topic modeling based bibliometric perspective	The results highlighted several research hotspots and emerging topics such as Technology-enhanced classroom pedagogy, Blended learning, Online social communities, Mobile	1971 - 2018	(Chen *et al.*, [10])

No	Discussion Topics	Educational Contribution	Year	References
		assisted language learning, Game-based learning and Socialized e-learning.		

Table 2
Previous studies of bibliometric analysis

No	Title	Topic Discussion	Ref
1.	A bibliometric analysis of covid-19 research using VOSviewer	Covid-19 research using a bibliometric review	(Ida et al., 2020)
2.	The Concise Latest Report on the Advantages and Disadvantages of Pure Biodiesel (B100) on Engine Performance: Literature Review and Bibliometric Analysis	Therefore, a bibliometric analysis was carried out to evaluate the performance and emissions of a diesel engine with the B100 being tested on a multi-cylinder diesel engine for cars.	(Setiyo *et al*., [45])
3.	A Bibliometric Analysis of Management Bioenergy Research Using Vosviewer Application Herman	This study provides data analysis regarding management bioenergy and its development throughout five years (2017–2021) by utilizing mapping tools in the VOSViewer. The	(Soegoto *et al.*, [49])
4.	Oil Palm Empty Fruit Bunch Waste Pretreatment with Benzotriazolium-Based Ionic Liquids for Cellulose Conversion to Glucose: Experiments with Computational Bibliometric Analysis	This study aims to utilize benzotriazolium salt-ionic liquids (ILs) as solvents in the oil palm empty fruit bunch (EFB) waste pretreatment along with bibliometric analysis using VOSviewer.	(Mudzakir *et al*., [29])
5.	Research Mapping in the Use of Technology for Fake News Detection: Bibliometric Analysis from 2011 to 2021	The research results can be used to determine the development of research o in the use of technology for fake news detection and as a reference for developing further research in the use of technology for fake news detection.	(Gunawan *et al*., [20])
6.	Management Information Systems: Bibliometric Analysis and Its Effect on Decision Making	Based on the results of hypothesis testing and significance, it can be interpreted that the management information system has a positive and significant effect on decision-making in the field of administration.	(Santoso *et al*., [42])
7.	Sustainable Production-Inventory Model with Multi- Material, Quality	The findings showed that the suggested HHO method	(Utama *et al*., [53])

	Degradation, and Probabilistic Demand: From Bibliometric Analysis to A Robust Model	outperforms the Genetic Algorithm (GA) and Particle Swarm Optimization (PSO) in maximizing ETP and this means it is better for ETP optimization. It	
8.	Phytochemical Profile and Biological Activities of Ethylacetate Extract of Peanut (Arachis hypogaea L.) Stems: In-Vitro and In-Silico Studies with Bibliometric Analysis	The results showed that EAE contained terpenoids, flavonoids, alkaloids, and phenolics which were supported by LC-MS/MS data. The EAE was categorized as a very strong antioxidant and moderately active in both cytotoxicity and toxicity.	(Sahidin *et al*., [40])
9.	Bibliometric Using Vosviewer with Publish or Perish (using Google Scholar data): From Step-by-step Processing for Users to the Practical Examples in the Analysis of Digital Learning Articles in Pre and Post Covid-19 Pandemic	The purpose of this study is to analyze and demonstrate step-by-step bibliometric data analysis using VOSViewer completely and systematically.	(Dwi Fitria Al Husaeni and Nandiyanto, [4])
10.	A Bibliometric Analysis of Nano Metal-Organic Frameworks Synthesis Research in Medical Science Using VOSviewer	The purpose of this research is to perform bibliometric analysis on nMOFs for medical science by combining mapping analysis using VOSviewer software.	(Shidiq, [48])
11.	Computational Bibliometric Analysis on Publication of Techno- Economic Education	This study was to analysed the scope of research on techno-economic education using bibliometric evaluation and data mapping approach (i.e., VOSviewer software).	(Ragadhita *et a*l., [39])
12.	Bibliometric Analysis of Magnetite Nanoparticle Production Research During 2017-2021 Using Vosviewer	The purpose of this study was to conduct a bibliometric analysis of the research on the production of Fe3O4 nanoparticles by using mapping analysis with VOSviewer software.	(Nugraha, [33])
13.	A Bibliometric Analysis of Nanocrystalline Cellulose Production Research as Drug Delivery System Using VOSviewer	The purpose of this study is to conduct bibliographical analysis in nanocrystalline cellulose production and its application as a drug delivery system, that combines mapping analysis with VOSviewer software.	(Fauziah, [18])
14.	Strengthening The Role of Local Community in Developing Countries Through Community-Based Tourism from Education Perspective: Bibliometric Analysis	The research aims to present the strengthening of the role of the local community in developing countries through CBT and find research gaps related to factors to strengthen the role of the local	(Pramanik and Rahmanita, [38])

		community in developing countries through CBT	
15.	Bibliometric Analysis of Educational Research in 2017 to 2021 using VOSviewer: Google Scholar indexed Research	The goal of this study is to combine mapping analysis with VOSviewer software to undertake a bibliometric analysis of research in the field of education. To	(D F Al Husaeni *et al*., [3])
16.	A Bibliometric Analysis of Vocational School Keywords Using VOSviewer	The goal of this study was to combine mapping analysis with VOSviewer software to conduct bibliometric engineering research at a vocational school. VOSviewer and Publish or Perish were the applications used in this study.	(Novia *et al*., [32])
17.	What is The Correlation Between Chemical Engineering and Special Needs Education from The Perspective of Bibliometric Analysis Using VOSviewer Indexed by Google Scholar	The goal of this research is to analyze “Chemical Engineering Special Needs” by combining mapping analysis and the VOSviewer app.	(Wirzal and Putra [57])
18.	Bibliometric Analysis of Special Needs Education Keyword Using VOSviewer Indexed by Google Scholar Dwi	The term "Special Needs Education" was utilized in this study as a keyword. According to the search results, 400 relevant articles were published between 2017 and 2021.	(D. N. Al Husaeni *et al*., [4])
19.	Bibliometric Analysis of Briquette Research Trends During the Covid-19 Pandemic	This study aims to analyze the scope of research on briquettes using bibliometric analysis and data mapping processes.	(D. N. Al Husaeni *et al*., [4])
20.	Bibliometric Data Analysis of Research on Resin-Based Brake-Pads from 2012 to 2021 using VOSviewer Mapping Analysis Computations	This study examines the mapping of research bibliometric data analysis related to resin-based brake pads.	(Nandiyanto *et al*., [3])

2. Methodology

This research uses a descriptive method with a bibliometric approach. In its application, the bibliometric approach uses quantitative techniques. This research uses the Google Scholar database as a data source. This research analysis focuses on two parts: (1) bibliometric mapping to examine trends in MOOCs in Higher Education, and (2) analysis of keywords indexed in articles to identify research clusters and understand research themes related to MOOCs in Higher Education. Data analysis is assisted by network visualization, overlay visualization, and density visualization displayed by VOSviewer software to make it easier to read. Such software can provide information about network metrics and clustering.

2.1 Prepare Tools and Material

The first step that must be taken in conducting a bibliometric analysis is to prepare the tools and materials to be used. Several applications need to be prepared, namely the Microsoft Excel application which is used for analysis and screening of search result data, the Publish or Perish (PoP) application which is used for searching and collecting article data based on keywords, and finally the VOSviewer application which is used for visualization and mapping search result data.

2.2 Harvesting Data

The keyword search chosen to be used in the literature search in the Google Scholar Database carried out on September 21 2023 was "open online course" AND "higher education". As an initial step, the researcher selected a document feature in the Google Scholar data base, then the keywords were written in a subsection of the document feature, namely 'document search', with a choice of search formats 'article title', 'abstract' and 'keyword'. The search results yielded 710 documents suitable for the 'Massive Open Online Course' sourced from articles, conference papers, book chapters, conference reviews, reviews, books, editorials, erratums and all languages, these documents were also output without using range settings. time.

2.3. Screening Data

Research documents collected during the data harvesting stage cannot be analyzed directly. As a result, data filtering is required. At this stage, data screening is carried out by taking into account the year of publication. Articles whose year of publication is missing are included. In addition, only journal articles were used in this study. Therefore, articles that are not sourced from journals will be deleted at this data screening stage. After screening the data, 710 articles were obtained which could be processed in this study.

2.4. Visualization Data

Data that has been saved in the format (*.ris) is then uploaded to the VOSviewer application to get data visualization. The terms in the VOSviewer network mapping visualization are filtered at this stage. The source database is used to map the article data. There are three types of visualization used in this study, namely network visualization, overlay visualization, and density visualization.

2.5 Analyzing Data

Data analysis in this research consists of performance analysis and science mapping. Analysis of co-authorship data, bibliographic merging, keyword occurrences, and citations was performed on bibliometric metadata using VOSViewer software. For bibliographic coupling, the relationships of elements such as publications, journals, and authors are determined based on the number of shared resources. Analysis of keyword occurrences reveals trends in a field of study over time. Therefore, the bibliometric approach is an efficient approach to identify trends in a particular research field. Citation analysis helps researchers detect popular research topics that other researchers are working on. The results of the analysis are then presented in the form of a table or network visualization map.

3. Results

3.1 Co-Authorship Analysis

Co-authorship analysis is a science mapping technique that assumes publications that are frequently cited together have similar themes. This technique is basically used to present social interactions between authors related to a particular research topic. The results of the analysis can be used to measure the quality of the structure in a particular research field, for example, such as the underlying topic. In co-authorship, two publications are connected when they appear together in the reference list of another publication, apart from that, through Co-authorship analysis researchers can also find influential researchers in a particular field. Co-authorship can also be interpreted as a form of research collaboration involving several parties such as researchers, institutions, organizations and society. Collaboration between researchers in each scientific discipline has different levels. The more often authors collaborate, the greater the collaboration in terms of research that can be achieved. Differences in the level of collaboration between scientific disciplines can be influenced by several factors, such as demographics, researcher information behavior, and gender.

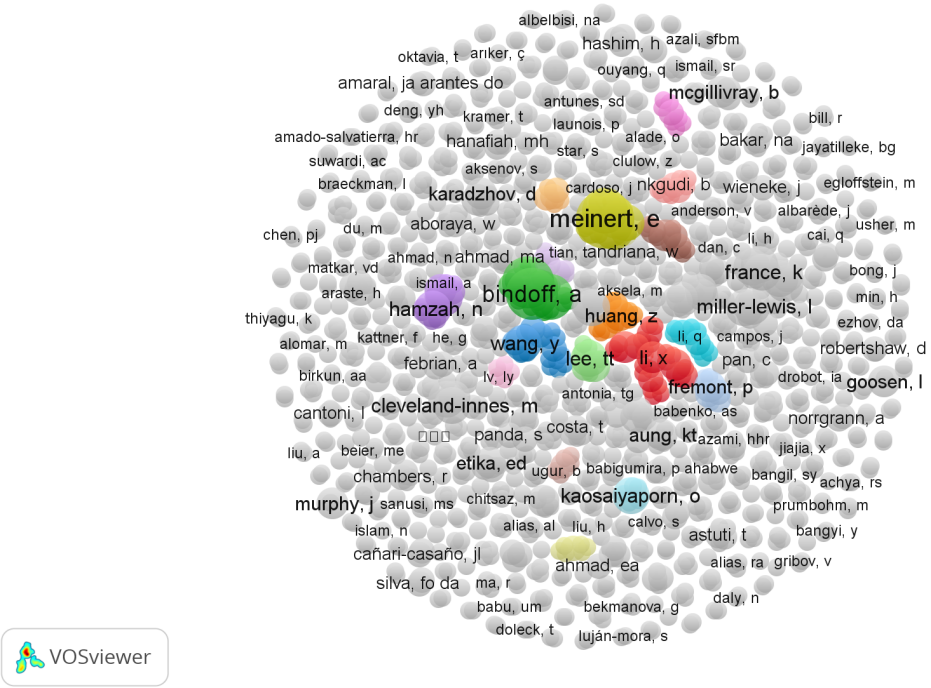

Fig. 1. Co-authorship network map in MOOC in higher education

During the 2018-2022 period there were various authors who contributed to this research topic, both singly and in collaboration. Figure 7 shows a network visualization of co-authorship which is marked with circles representing researchers, and the network represents relationships between researchers. The data obtained then displays a total of 1435 authors who wrote at least 1 article, divided into clusters with different colors. The connection between the links shows that the authors conducted research together, and the stronger the relationship between the authors, the larger the circle formed. The visualization graph shows that most of the authors are not connected, because they do not collaborate with each other. Collections of circles without a network appear to dominate, so we can interpret that research collaboration on the topic of Micro Credentials in Higher Education is still very small. This is certainly a challenge and opportunity for researchers to build collaboration.

3.2 Most Influential Researchers

Collaborative research can empirically improve research quality, articles tend to be cited more when they have more authors. Apart from that, collaborative research can also improve the quality of an organization's research, the more collaborative research there is, the quantity and quality of the institution's research will also increase. The visualization in the form of the figure 2 below shows the highest relevance of various authors who publish their research on the topic "Open Online Course".

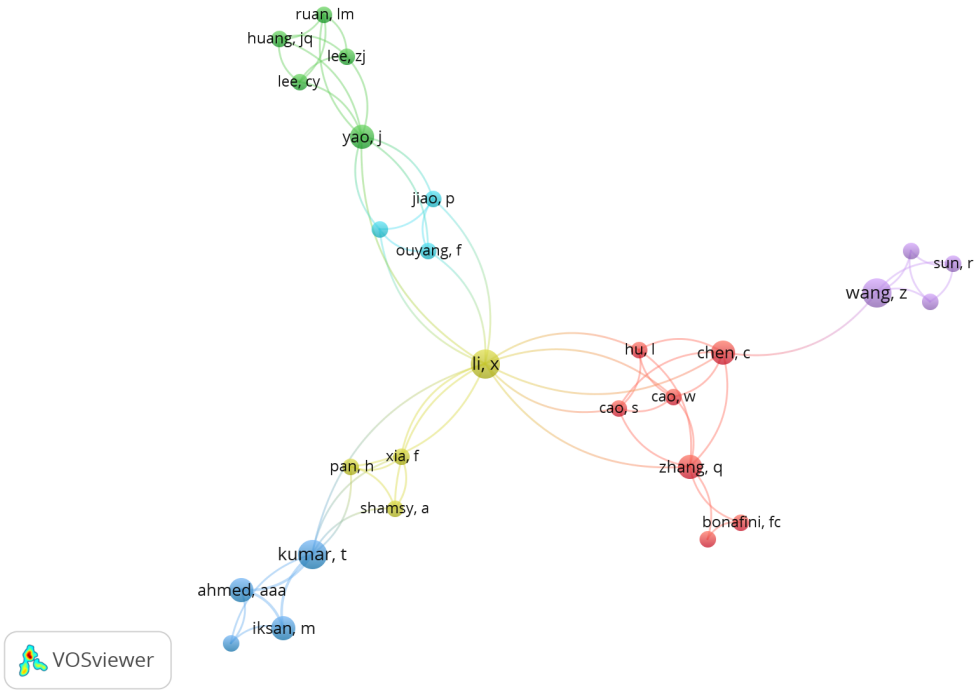

Fig. 2. Co-authorship network map in MOOC in higher education with highest collaboration

3.3. Co-Occurence Analysis

After the dataset is saved in the RIS type using Google Scholar metadata, the dataset is then analyzed using the Vosviewer application by selecting the data option 'create a map based on text data', with the aim of creating a network or term relationship based on text data. The term field is

extracted based on the title and abstract, while the method used to calculate the dataset is full counting. Co-occurrence analysis revealed that the keywords were grouped in six clusters or groups, as shown in Figure 2. The keywords in the clusters provide information about related research topics in the area of interest [19].

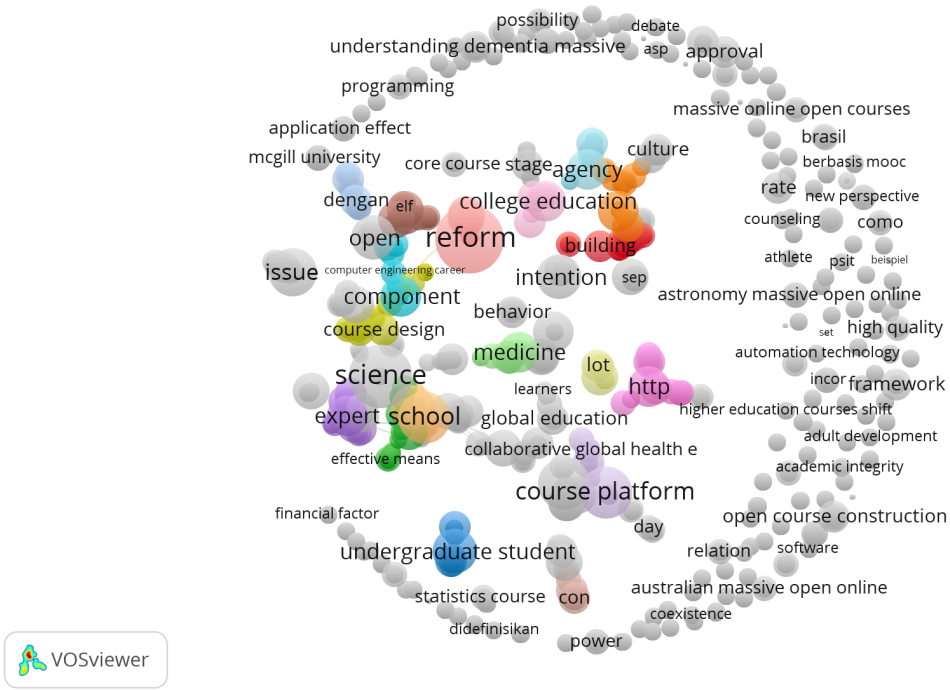

Fig. 3. Network visualization map of keywords' co-occurrence

Figure 3 shows a network visualization of co-occurrence which explains the network or relationship of one term with another term in research in the field of Open Online Courses in Higher Education in the period 2018 - 2022. From the visualization results it can be seen that there are several occurrences that are more prominent than those mentioned above. other. Based on the results of the VOS Viewer analysis, 11 terms were chosen because they have a large occurrence value and a high level of relevance. The data is then presented in table form below.

Term	Occurrences	Relevance
reform	15	0.60
science	12	0.72
educational institution	9	0.60
course platform	8	0.73
school	8	0.72
open	8	0.70
issue	7	0.76
activity	6	0.80
expert	6	0.75
intention	6	0.74
undergraduate student	6	0.71

Fig. 4. Research trends cluster

After identifying the mapping using network visualization, the next step is to map and cluster Micro Credentials in Higher Education research trends based on the year the research was published. The information obtained from the Overlay visualization results in Figure 8 can be used as a reference for identifying and detecting the state of the art from research in the field of Open Online Courses in Higher Education.

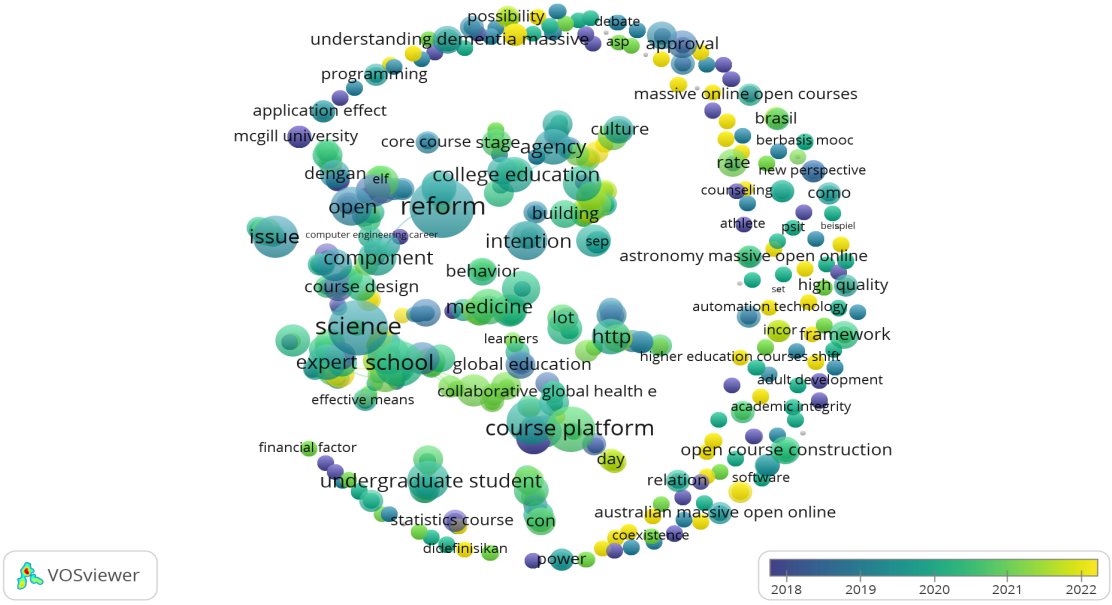

Fig. 5. Overlay visualization map of keywords' co-occurrence

From the results of bibliometric analysis via Scopus metadata which was visualized using Vosviewer software, an overlay visualization was produced. In this visualization, the colors in the nodes represent keywords that indicate the year of publication. Brighter colors represent publications with related keywords that were published in the most recent year. For example, the keyword "reform" shows the color of the year of publication between 2019-2020. Then several keywords in publications published in 2022 include "digital learning platform", "higher technology", "behavioral tools", and "literacy".

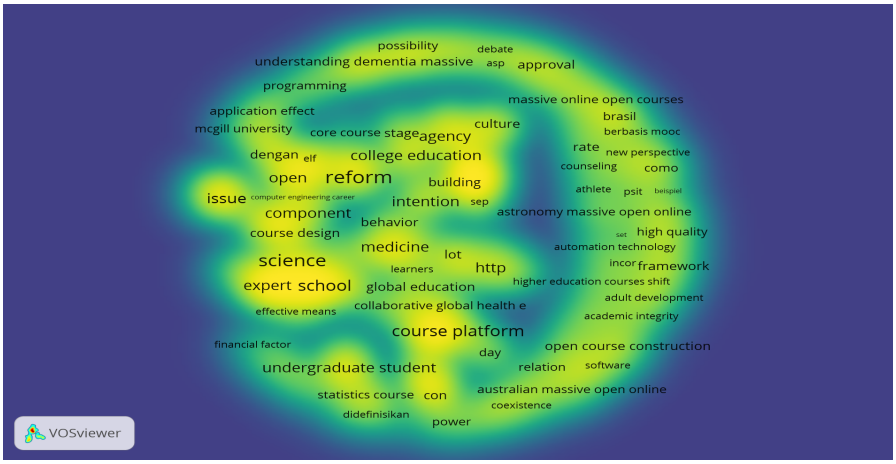

Fig. 6. Density visualization map of keywords' co-occurrence

Next is bibliometric analysis using density visualization. From the visualization results shown in Figure 10, it can be identified that there are areas that have high density at one node compared to other nodes. The level of saturation identified in the number of keywords is marked in yellow, which means that the area is a topic that has been widely researched and indexed by Google Scholar.

4. Conclusion

This research aims to examine the growth trend in the MOOCs in higher education research field from 2018 to 2022 using the Google Scholar database set. As a research technique, bibliometric analysis is used. In the search results, the term Open Online Course appears in 710 articles. As technology has liberated the learning and teaching process, geographical limitations there are no longer any barriers to providing and receiving quality education. The creation of technology in a global learning environment makes it possible to access learning materials from anywhere and at any time. With changing lifestyles and advances in technology, people prefer independence in their learning process. Therefore, new innovative ways of learning are emerging in the current scenario and massive open online courses (MOOCs) or online learning is one such innovative method MOOCs are a new and innovative method that offers a blended education model with several key features such as online lectures, video sessions, slide shows, discussion forums, and a number of combinations. This new model of education is available to anyone who is interested in learning without any restrictions.

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