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INTERNATIONAL STUDENTS IN ONLINE LEARNING: A BIBLIOGRAPHIC ANALYSIS USING BIBLIOGRAPHY

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ABSTRACT

This bibliometric study examines the distribution of publications about international students in online learning that have been published in reputable journals indexed by Scopus. The analysis concentrates on describing the characteristics and patterns of publications, authors, journals, countries, and author keywords. Four hundred fifty documents that have been retrieved from the Scopus database were analyzed. The phrases "international" and "learning" were used for searches. To create bibliometric maps, descriptive statistical techniques were applied, and Biblioshiny, an R-based program, was used for bibliometric analysis. The year 2022 saw the highest number of documents published, with 101. Articles have the most publications, with a total of 273 publications. "Journal of International Students" is the most productive journal, with 11 published documents. Chew, E. (United Kingdom) and May, D. (Georgia) are the most prolific authors with four documents. "International student" was the most used term, with 110 occurrences, followed by "online" (63) and COVID-19 (57). This study provides information for academics specializing in the field of international students and learning by providing an overview of the most popular keyword trends, journals, and authors on the issue of international students in online learning, which has been a theme that is quite popular in the world. This idea can be developed and carried out through further research in the future.

Keywords: International Student, Online Learning, Bibliometric, Biblioshiny, Scopus

1. INTRODUCTION

Globally, the use of online learning is growing in higher education settings [1]. Although most students appreciate the flexibility of time and space that are online learning offers, many perceive the absence of interaction and prompt feedback as a barrier to effective learning [2], and they have to venture into their homes for the learning resources required and continue their studies online [3]. This, of course, applies to local and international students, but international students are the most likely to carry out the online learning process. According to a survey conducted by the QS UK International Student Survey (ISS), 105,083 international students from 191 different countries responded to the experience of switching to online learning since the pandemic started and how it will affect their academic endeavours in the future [4]. International students are one of the cultural and promotional agents for each country to be better known by other countries, which are, of course, related to positive things.

Students who travel across borders specifically to further their education are referred to as "international students" [5]. Mobility among international students is an important component of the globalization of education. From 0.8 million in 1975 to 4.1 million in 2010, the number of foreign students has more than quintupled over the last three decades [6], with around 5 million international students in 2014 [7], and the OECD projects that by 2025, there will be 7.2 million students worldwide pursuing higher education abroad, with the majority of international students being doctoral students who tend to study abroad. For example, one out of every six Chinese studies abroad [8]. Compared to local students,

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their contributions to this field, and exploring publication networks and cross-disciplinary collaborations across institutions, countries, and regions over time. This study also aims to find any changes in the environmental boundaries of international students in online learning.

2. METHOD

This study uses statistical analysis of publications, or so-called bibliometric analysis, a scientific publication analysis technique, to track the distribution and effectiveness of research worldwide from a variety of diverse disciplines. This study uses Scopus data sources. Due to its strong reputation as a major multidisciplinary database of abstracts and citations, the authors decided to conduct a bibliometric study using the Scopus database. Peer-reviewed academic publications, including books, journals, and conferences, are easily accessible through Scopus, a division of the larger information and analytics company Elsevier [22]. Because Scopus has more documents than other databases such as Web of Science and Pubmed and has long been a source of reference for scholars [23], it was chosen over the others [24].

In the Scopus database, metadata searches use the phrases "international student*," "online," and "learning" to find all publications that have been published between 1998 and 2023 (January 8, 2023). To obtain data and documents as a whole, title-abs-key was sought in this study. All procedures—from data collection to data screening for existing publications—formed the basis of this investigation [25] and used a web-based application, namely Biblioshiny [16], to carry out an analysis of the data that has been obtained.

3. RESULTS AND DISCUSSION

3.1 General Profile

In this section, the growth and development in the field of research by international students in online learning will be described in detail with various kinds of information regarding this field. Through the various analysis parameters obtained and presented in the research results section of this paper, of course, we will try to map what we got from the results of the analysis of the 450 pieces of metadata that we analyzed with the help of webbased mapping analysis, namely Biblioshiny. Many countries and institutions implement strict strategies and regulations by increasing bilateral or multilateral cooperation, making it possible for prospective foreign students to come to each

international students often choose alternative academic programmes [9]. The OECD's Program for International Student Assessment (PISA) has emerged over the last ten years as the leading standard for assessing the effectiveness, fairness, and quality of education systems worldwide [10]. Science, math, and reading are all covered in the 2018 evaluation, with the main emphasis this cycle on reading literacy. Students global competence their capacity to understand and value the perspectives and worldviews of others—was measured for the first time. An optional assessment is provided for financial literacy [11].

This study uses bibliometric techniques and focuses on mapping literature from the Scopus database [12]. The use of bibliometric analysis, a relatively new research technique, has developed in a number of disciplines. This is a subfield of scientometrics, which is the study of the quantitative aspects of science and scientific inquiry [13]. Bibliometrics can provide scholarly information on a given topic by analyzing publishing features such as authorship, source, institution, journal, citation, country of the author of correspondence, and even co-citation networks [14,15]. An effective method for conducting bibliometric analysis of scientific articles is to use the Science Mapping Technique with the Bibliometric R package [16]. According to the bibliometric analysis approach, publication sources or other documents containing bibliometric data are processed using quantitative methods [17]. To examine printed sources of information and other forms of communication, the bibliometric analysis provides useful statistical and mathematical methods [18].

Several similar studies summarised recent publications related to international students in online learning and used bibliometric techniques to map developments in this field, such as language and communication in the adaptation of international students [19], international student mobility in Asia [20], and the mental health of international students [21]. The bibliometric analysis is relevant because the aim of this research is to provide an in-depth examination of smart learning environments. To our knowledge, there has not been a thorough bibliometric analysis of the literature on international students in online learning. This study is the first to conduct a bibliometric analysis of the field with the explicit aim of examining trends in international student publications in online learning over time, investigating the distribution of themes in publications, identifying prolific researchers and



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country to study through exchanges or regular lectures. Therefore, by offering insights and evidence-based descriptions of the influence of existing studies, analysis of the most well-known articles, authors, journals, institutions, and countries will enhance the expansion of relevant research for international students. Table 1 provides a general description of the metadata that has been retrieved and analyzed by the Biblioshiny website-based software.

| Table | 1 | Main | in | formation |
|-------|----|------|----|-----------|
| ruoic | 1. | mann | uu | joimanon |

| Main Information about D | ata | Document Contents | | |
|--------------------------------|-----------|---------------------------------|-------|--|
| Timespan | 1998:2023 | Keywords Plus (ID) | 1225 | |
| Sources (Journals, Books, etc) | 323 | Author's Keywords (DE) | 1252 | |
| Documents | 450 | | | |
| Annual Growth Rate % | 0 | Authors | | |
| Document Average Age | 5,56 | Authors | 1179 | |
| Average citations per doc | 7,349 | Authors of single-authored docs | 92 | |
| References | 17.833 | _ | | |
| Document types | | Authors Collaboration | | |
| Article | 273 | Single-authored docs | 109 | |
| Book | 6 | Co-Authors per Doc | 2,86 | |
| Book chapter | 44 | International co-authorships % | 19,11 | |
| Conference paper | 105 | - | | |
| Conference review | 8 | | | |
| Data paper | 1 | | | |
| Letter | 1 | | | |
| Retracted | 1 | | | |
| Review | 11 | | | |

Table 1 provides general information regarding the 450 articles that have been analyzed. The publication type is the most important of the headlines. Related to the general profile of the metadata we analyzed from 1998-2023. We can learn that the number of publications related to international students in online learning is increasing, with the highest peak occurring in 2022, with a total of 101 documents (12.8% increase) from the previous year. With a total of 450 published articles, it should be noted that the article type has the highest number of publications, with a total of 273 publications. Conference paper-type publications are in second place with 105 publications, followed by book chapter-type publications (25), review types (11), conference review types (8), books (6), and data paper, letter, and retracted publications for each publication. From the contents of the document, there are more author keywords compared to plus keywords, namely 1,252 versus 1,225. Furthermore, what is interesting is the collaboration of authors, especially for international co-authorships, which accounts for 19.11%. This shows that having international students can contribute to collaborative research between countries or between affiliates.

3.2 Journal of the Main Purpose of Authors in International Student Research

The goal of journal publishers is to provide academics with a platform to communicate their findings to the public in order to advance the body of knowledge in a particular field of study. In this case, the number of publications published in influential journals can be used to determine the quality of international students' research in online learning. The impact and influence of a particular journal are determined by criteria such as publisher, h-index, quartiles, and SJR. Table 2 lists the top 10 journals based on the number of publications included in this study.

Despite being in the 10th position, "Online Learning Journal" has the highest SJR score of 1.5 compared to the other top ten journals, and this journal is also included in one of the ten journals with the highest quartile, namely Q1. "Journal of International Students," published by the University of Louisiana at Monroe, United States, is the journal with the most, and this journal is also included in one of the ten journals with the highest quartile, namely Q1. "Journal of International Students," published by the University of Louisiana at Monroe, United States, is the journal with the most publications, with 11 documents. "Frontiers in Psychology," published by Frontiers Media SA, Switzerland, has the highest H-index with 133. It is important to note that in order to maintain the reputation of the journal, articles published in it

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have passed a rigorous quality review. Figure 1 from provides more detail on the publication growth

from 1998 to 2023.

| Table 2. Primary Purpose Journal | | | | | | | | |
|----------------------------------|--|----------|--|---------|---------|------|--|--|
| Rank | Journal | Document | Publisher | H-Index | Quartil | SJR | | |
| 1 | Journal of International Students | 11 | University of Louisiana at Monroe | 18 | Q2 | 0.57 | | |
| 2 | ASEE Annual Conference and Exposition Conference Proceedings | 7 | American Society and Engineering Education | 37 | Q4 | 0.00 | | |
| 3 | Frontiers in Psychology | 7 | Frontiers Media SA. | 133 | Q1 | 0.87 | | |
| 4 | International Review of Research in Open and Distance Learning | 6 | Athabasca University | 73 | Q1 | 1.32 | | |
| 5 | Journal of Studies in International Education | 6 | SAGE Publications Inc. | 64 | Q1 | 1.13 | | |
| 6 | Sustainability Switzerland | 6 | MDPI AG | 109 | Q1 | 0.66 | | |
| 7 | ACM International Conference Proceeding Series | 5 | Association for Computing Machinery (ACM) | 128 | Q4 | 0.23 | | |
| 8 | Higher Education Research and Development | 5 | Taylor and Francis Ltd. | 76 | Q1 | 1.44 | | |
| 9 | Lecture Notes in Computer Science, Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics | 5 | Springer Verlag | 47 | Q4 | 0.19 | | |
| 10 | Online Learning Journal | 5 | The Online Learning Consortium | 55 | Q1 | 1.5 | | |

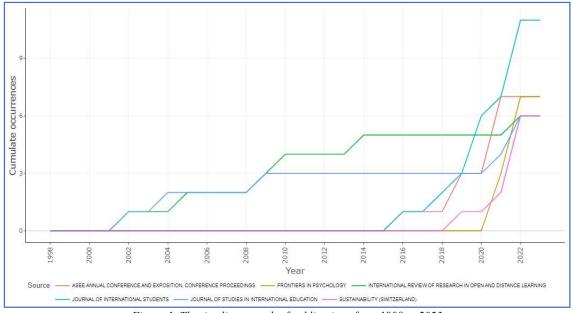


Figure 1. The timeline growth of publications from 1998 to 2023

3.3 Articles get the most citations.

From 1998 to 2023, the contributions of many scientists have significantly influenced international students' research developments in online learning. Table 3 lists the influential and most-cited articles

or those cited by other authors that were produced as a result of the analysis and have had a major impact on how international student research in online learning has developed.

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Table 3. The most cited articles TC per Normali TC Title Author Year Ref. zed TC year Coronavirus (COVID-19) and Online Learning in Higher Institutions of Education: A Survey of Demuyakor, J. 2020 188 47,00 17.59 [3] the Perceptions of Ghanaian International Students in China Why do some distance education programs fail Rovai, A. P., & 2010 166 11,86 6,58 [26] while others succeed in a global environment Downey, J. R. Cultural Differences in Online Learning: Xiaojing, L., et 2010 142 10,14 5,63 [27] International Student Perceptions al. Postgraduate research success: communities Wisker, G., et of practice involving cohorts, guardian 2007 117 6,88 3,92 [28] al. supervisors and online communities Towards understanding international graduate Erichsen, E. A., student isolation in traditional and online & Bolliger, 2010 88 6,77 6,10 [29] D.U. environments Teaching large classes in an increasingly Maringe, F., & internationalizing higher education environment: 2014 77 7,70 5,02 [30] Sing, N Pedagogical, quality and equity issues Mental Health Impacts of the COVID-19 Agnes Yuen-Pandemic on International University Students, 2020 61 15,25 5,71 [31] Kwan Lai et al. Related Stressors, and Coping Strategies The adaptation of Chinese international students Chen, R. T., et 2008 60 3,75 2,22 [2] to flexible online learning: two case studies al. The relationship between students' exposure to Delen, E., & technology And their achievement in science and 2011 55 4,23 3,81 [32] Bulut, O. math Learning in an Online Distance Education Zhang, Z., & 2010 Course: Experiences of Three International 54 3.86 2,14 [33] Kenny, R.F. Students

Demuyakor, J.'s research in 2020 [3] received the most citations, with a total of 188 citations. From the results of Demuyakor's research, it was determined that implementing an online learning programme was a very good idea because most of the students participating in the sample agreed with the concept. In addition, this study found that students were well-informed about the COVID-19 epidemic. The high cost of taking online courses is another discovery made during the research. Other findings show that students outside of China are spending a lot of money buying internet data for online learning as a result of COVID-19. Another thing is that students who leave the dormitories of several institutions in China experience very poor internet connectivity.

The second article that received the most citations (above 150) was an article produced by Rovai & Downey's research (2010) [26]. Their article received 166 citations. The research found that online programmes that were in danger of collapsing were those that failed to adjust to a competitive environment. This article examines seven important characteristics that contribute to the success or failure of online programs, drawn from the research literature and US Securities and Exchange Commission (SEC) filings. Planning, marketing and recruiting, financial administration, quality control, student retention, faculty development, and online course design and pedagogy are some of those factors.

Contributing influential publications published in the Scopus database can be used to identify subjects of interest for research on the international student sector in online learning. It is important to draw attention to this paper as its contributions are later expanded upon and published in high-impact journals by other scholars. In addition, all published publications related to the international student sector in online learning and indexed in the Scopus database are considered important documents as they also help the research community generate fresh concepts and new information.

3.4 The most prolific authors

International students' research development in online learning has been facilitated by a number of authors. These authors should publish their findings

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in order to share their research findings with other academics and defend their position in the field. This shows that the authors are managing the increased demand to publish along with their research at the same time. The most productive researchers in this field are listed in Table 4, with the criteria of having at least three scientific publications.

Table 4 and Figure 2 show that Australia is quite active in publishing publications, with the majority of the most prolific authors being Chinese and American. It is clear that Pakistan, from the continent of Asia and as the only developing country based on Figure 2, is able to contribute a large number of publications in the international student sector on online learning. The growth aspect also reveals that, compared to other authors, there are no representatives from the African continent at the top of the list. This proves that the majority of countries on the African continent are still experiencing difficulties in the growth and development of technology regarding online learning, and it seems that there are still a few international students from the African continent who continue their studies in other countries.

| Table 4. | The most | prolific | authors |
|----------|----------|----------|---------|
|----------|----------|----------|---------|

| Name Authors | Country | Affiliation | Publication |
|----------------------------|----------------|-------------------------------------|-------------|
| Chew, E. | United Kingdom | University of Glamorgan | 4 |
| May, D. | Georgia | University of Georgia | 4 |
| Hu, J. | China | Chongqing University | 3 |
| Murphy, E. | Canada | Memorial University of Newfoundland | 3 |
| Popov, V. | United States | University of San Diego | 3 |
| Rienties, B. | Netherlands | Maastricht University | 3 |
| Rodríguez-Manzanares, M.A. | Canada | Memorial University of Newfoundland | 3 |
| Sadykova, G. | Russia | Kazan Federal University | 3 |
| Sleeman, J. | Australia | La Trobe University | 3 |
| Starr-Glass, D. | United States | SUNY Empire State College | 3 |
| Tekkaya, A.E. | Germany | Technical University Dortmund | 3 |
| Tian, M. | China | Jiaotong University | 3 |
| Wilczewski, M. | Polandia | University of Warsaw | 3 |

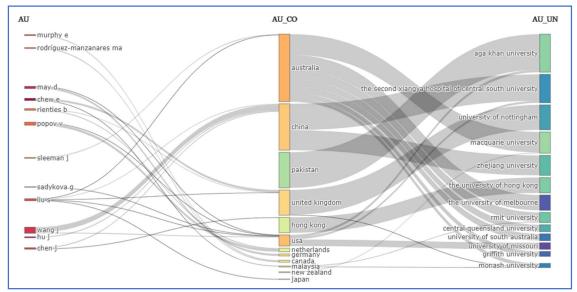


Figure 2. Relationship between authors, countries and affiliations

3.5 The most active institution

Universities are organizations that offer the tools needed to conduct research, such as funding and libraries. To give research initiatives the support they need and to help them move forward, finance has an important role to play. In addition, as some universities aim to expand their number of publications, they tend to concentrate more on research. As a result, the authorities are giving research a higher priority in terms of funding. Institutions can also offer professional researchers access to research resources such as laboratories,

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facilitate the conduct of research, and advance the institution's status as an academic powerhouse. Institutions that have conducted research related to international students in online learning are listed in Table 5.

| Table 5. The most active institution | | Table 5 | The | most | active | institution | |
|--------------------------------------|--|---------|-----|------|--------|-------------|--|
|--------------------------------------|--|---------|-----|------|--------|-------------|--|

| Affiliation | Country | Articles |
|-------------------------------|-----------|----------|
| Macquarie University | Australia | 22 |
| Aga Khan University | Pakistan | 15 |
| The University of Hong Kong | Hongkong | 15 |
| RMIT University Melbourne | Australia | 14 |
| Zhejiang University | China | 14 |
| Central Queensland | Australia | |
| University | | 13 |
| | United | |
| University of Nottingham | Kingdom | 13 |
| The Second Xiangya Hospital | China | |
| of Central South University | | 12 |
| Monash University | Australia | 10 |
| University of South Australia | Australia | 10 |

All these institutions, as can be seen, are spread across five different countries. Australian institutions dominate publications, followed by institutions from China with the second-highest number of publications. What is remarkable is that an institution from Pakistan is able to compete and contribute to international student-related publications in online learning. The quantity of international students' publications in online learning greatly enhances the reputation of the university, educational institution, or research institution concerned. However, it is important to note the era of publication where the majority of publications have a concentration on online learning, with each era demonstrating the institution's significance and contribution to the expansion of the field of online learning research.

3.6 Most active country

The publications of international students in online learning are discussed in this section in terms of the distribution of countries from several continents. The aim is to track the volume of publications between 1998 and 2023. A list of continents and the number of related publications are shown in Table 6.

Table 6. Distribution of countries by continent

| Asia Continent | | | | | | |
|----------------|-----------|---------------|-----------|-----------|-----------|-------|
| Countries | Periode 1 | Periode 2 | Periode 3 | Periode 4 | Periode 5 | Total |
| Countries | 1998-2002 | 2003-2007 | 2008-2012 | 2013-2017 | 2018-2023 | |
| China | 0 | 1 | 10 | 71 | 587 | 669 |
| Korea | 0 | 0 | 3 | 5 | 34 | 42 |
| Malaysia | 0 | 0 | 2 | 101 | 270 | 372 |
| Kazakhstan | 0 | 0 | 1 | 9 | 12 | 22 |
| Japan | 0 | 0 | 0 | 23 | 100 | 123 |
| Singapore | 0 | 0 | 0 | 7 | 24 | 31 |
| Indonesia | 0 | 0 | 0 | 8 | 89 | 97 |
| Nepal | 0 | 0 | 0 | 3 | 6 | 9 |
| Hongkong | 0 | 0 | 0 | 5 | 86 | 91 |
| India | 0 | 0 | 0 | 2 | 24 | 26 |
| Lebanon | 0 | 0 | 0 | 0 | 18 | 18 |
| Jordan | 0 | 0 | 0 | 0 | 4 | 4 |
| Saudi Arabia | 0 | 0 | 0 | 0 | 6 | 6 |
| Thailand | 0 | 0 | 0 | 0 | 16 | 16 |
| Yemen | 0 | 0 | 0 | 0 | 7 | 7 |
| Azerbaijan | 0 | 0 | 0 | 0 | 3 | 3 |
| Oman | 0 | 0 | 0 | 0 | 3 | 3 |
| Pakistan | 0 | 0 | 0 | 0 | 17 | 17 |
| Philippines | 0 | 0 | 0 | 0 | 3 | 3 |
| Bahrain | 0 | 0 | 0 | 0 | 2 | 2 |
| Iran | 0 | 0 | 0 | 0 | 2 | 2 |
| Kuwait | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 0 | 1 | 16 | 234 | 1.315 | 1.566 |
| North America | | | | | | |
| United States | 12 | 56 | 170 | 321 | 891 | 1.450 |
| Canada | 0 | 0 | 30 | 72 | 184 | 286 |
| Mexico | 0 | 0 | 0 | 0 | 4 | 4 |
| Total | 12 | 56 | 200 | 392 | 1.079 | 1.739 |
| | | Australia and | Oceania | | | Tota |

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| | | | | | | |
| 1 | 73 | 174 | 385 | | | |
| 0 | 0 | 2 | 5 | | | |
| 0 | 0 | 3 | 30 | | | |
| 1 | 73 | 179 | 420 | | | |

| 1 1) 1 | 0 | 0 | 4 | 5 | 0 | 12 |
|----------------|--------|----------|--------|-----|-------|-------|
| New Zealand | 0 | 0 | 3 | 30 | 82 | 115 |
| Total | 1 | 73 | 179 | 420 | 1.076 | 1.748 |
| Total | 1 | 15 | 177 | 420 | 1.070 | 1./40 |
| | | South An | nerica | | | Total |
| Argentina | 0 | 0 | 4 | 5 | 6 | 15 |
| Brazil | | | 4 | | 9 | 9 |
| | 0 | 0 | | 0 | | |
| Costa Rica | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 0 | 0 | 4 | 5 | 17 | 26 |
| | | Afric | _ | | | Tetal |
| | 0 | | | 12 | 20 | Total |
| South Africa | 0 | 0 | 3 | 13 | 39 | 55 |
| Uganda | 0 | 0 | 0 | 0 | 3 | 3 |
| Ghana | 0 | 0 | 0 | 0 | 3 | 3 |
| Tanzania | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 0 | 0 | 3 | 13 | 47 | 63 |
| | | F | | | | Tatal |
| NT (1 1 1 | 0 | Euroj | | () | 1.4.1 | Total |
| Netherlands | 0 | 9 | 18 | 62 | 141 | 230 |
| United Kingdom | 0 | 14 | 80 | 201 | 455 | 750 |
| Lithuania | 0 | 2 | 5 | 5 | 6 | 17 |
| Germany | 0 | 1 | 18 | 58 | 266 | 343 |
| Israel | 0 | 1 | 5 | 10 | 16 | 32 |
| Spain | 0 | 0 | 4 | 8 | 56 | 68 |
| Tukey | 0 | 0 | 8 | 17 | 70 | 95 |
| Italy | 0 | 0 | 3 | 5 | 35 | 43 |
| Romania | 0 | 0 | 12 | 20 | 24 | 56 |
| Slovenia | ů 0 | ů 0 | 9 | 15 | 18 | 42 |
| Belgium | 0 | 0 | 0 | 7 | 27 | 34 |
| Estonia | 0 | 0 | 0 | 3 | 9 | 12 |
| | | | | - | | |
| Finland | 0 | 0 | 0 | 18 | 48 | 66 |
| Greece | 0 | 0 | 0 | 3 | 16 | 19 |
| Switzerland | 0 | 0 | 0 | 1 | 12 | 13 |
| Austria | 0 | 0 | 0 | 0 | 8 | 8 |
| Denmark | 0 | 0 | 0 | 0 | 14 | 14 |
| Latvia | 0 | 0 | 0 | 0 | 12 | 12 |
| Luxembourg | 0 | 0 | 0 | 0 | 12 | 12 |
| Poland | 0 | 0 | 0 | 0 | 17 | 17 |
| Czech Republic | 0 | 0 | 0 | 0 | 19 | 19 |
| Ireland | Ő | Ő | Ő | Ő | 29 | 29 |
| Norway | 0 | ů 0 | 0 | 0 | 13 | 13 |
| Portugal | 0 | 0 | 0 | 0 | 23 | 23 |
| | | | 0 | | | |
| Cyprus | 0 | 0 | | 0 | 14 | 14 |
| Hungary | 0 | 0 | 0 | 0 | 18 | 18 |
| France | 0 | 0 | 0 | 0 | 2 | 2 |
| Sweden | 0 | 0 | 0 | 0 | 2 | 2 |
| Ukraine | 0 | 0 | 0 | 0 | 8 | 8 |
| Total | 0 | 27 | 162 | 433 | 1.389 | 2.011 |
| | | | | | | |

It must be emphasized that continental Europe as a whole contributed the most publications, with the United Kingdom contributing 750 articles. Meanwhile, South America has the least number of international research students in online learning among countries on other continents.

3.7 Research collaboration network map

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Australia Fiji

The bibliometric approach of international students in online learning is shown in the form of a

network map in this section. Collaboration between countries seems to be a very common thing done by researchers around the world. The network exemplifies global collaboration trends relevant to each country. This study examines the history of active network collaboration to track the scientific progress of nations around the world. In this context, "collaboration" refers to a network detailing the contributions of authors across 30th April 2023. Vol.101. No 8 © 2023 Little Lion Scientific

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countries. Analyzing the relationship between the

research related to international students in online

learning is shown in Figure 2. The red line, which

indicates collaboration among authors across

countries, highlights international collaboration.

Australia, the UK, and the US are countries that

Country Collaboration Map

Global cooperation among countries and

author and co-authors reveals this.

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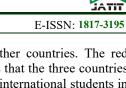
actively collaborate with other countries. The red line in the graph also shows that the three countries have published research on international students in the most collaborative online learning environment. The publications of these countries perform better and receive more citations as a result of their cooperation.

| 8 |
|-------|
| |

Latitude Figure 3. Collaboration network map

| | Australia | United Kingdom | | | | United States | | |
|-----------|----------------|----------------|------|-----------------|-------|---------------|----------------|------|
| From | То | Freq. | From | То | Freq. | From | То | Freq |
| Australia | Brazil | 1 | UK | Brazil | 1 | USA | Belgium | 1 |
| Australia | China | 3 | UK | Costa Rica | 1 | USA | China | 7 |
| Australia | Cyprus | 1 | UK | Cyprus | 1 | USA | Germany | 1 |
| Australia | France | 1 | UK | France | 1 | USA | India | 1 |
| Australia | Greece | 1 | UK | Germany | 1 | USA | Italy | 1 |
| Australia | Hong kong | 1 | UK | Greece | 2 | USA | Korea | 1 |
| Australia | Iran | 1 | UK | Israel | 1 | USA | Mexico | 1 |
| Australia | Italy | 1 | UK | Italy | 1 | USA | Netherlands | 3 |
| Australia | Japan | 1 | UK | Korea | 1 | USA | Pakistan | 1 |
| Australia | Korea | 1 | UK | Latvia | 1 | USA | Poland | 1 |
| Australia | Kuwait | 1 | UK | Lithuania | 1 | USA | South Africa | 2 |
| Australia | Latvia | 1 | UK | Malaysia | 1 | USA | Spain | 1 |
| Australia | Malaysia | 2 | UK | Netherlands | 1 | USA | Turkey | 1 |
| Australia | New Zealand | 1 | UK | Philippines | 1 | USA | United Kingdom | 4 |
| Australia | Philippines | 1 | UK | South Africa | 2 | | - | |
| Australia | Singapore | 1 | UK | Spain | 2 | | | |
| Australia | Thailand | 1 | UK | Turkey | 1 | | | |
| Australia | United Kingdom | 4 | | - | | | | |
| Australia | USA | 1 | | | | | | |

The frequency of international research collaborations is calculated in Table 7. Australia has been identified as having the most cooperation with 19 other countries in the world. Australia was identified as having the most collaboration with the United Kingdom, namely four (4) research collaborations. The UK is in second place for the most collaboration with other countries in the





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world, namely with 17 other countries. The most British collaborations are with Greece, South Africa, and Spain, namely two (2) research collaborations. Meanwhile, the United States is in third place with 14 collaborations with other countries, and China is the country with which the United States has made the most collaborations, namely seven (7) research collaborations. This shows that the United States and China have an excellent working relationship when it comes to sharing and publishing international students' research in high-quality online learning. More cooperation between these countries is anticipated as a result of the publication of excellent studies in reputed journals.

3.8 Keyword analysis

Findings about the emergence of terms related to international students in online learning in the keywords of articles, abstracts, and titles are covered in this section. In addition to identifying disciplinary areas related to online learning and research gaps, this analysis attempts to analyze current research trends. Author keywords play an important role in increasing publication exposure, especially in helping other scholars find relevant content.

Four hundred fifty publications between 1998 and 2023 were analyzed to yield author keywords, abstracts, and original titles of articles. The bigger and thicker the size of the keywords that appear in the word cloud, the more frequently these keywords are used in articles. The keyword "international student" was the most frequently used term, with 110 occurrences, followed by "online" (63) and COVID-19 (57). Figure 4 shows how often various terms relating to international students in online learning appear in the article titles, abstracts, and author keywords. Meanwhile, figure 5 shows trending topics for the last ten years, in which the keyword "COVID-19" is the most trending keyword, followed by "student engagement," and the third position is the keyword "China." Of course, the impact of online learning began to be felt when the COVID-19 outbreak began to spread throughout the world, and of course, this had an impact on the learning system that was being implemented. Both local and international students almost learn online and operate thanks remotely to the communication platforms offered by the InternetInternet. For example, teachers and students can use smartphones and the InternetInternet as media to carry out the teaching and learning process.

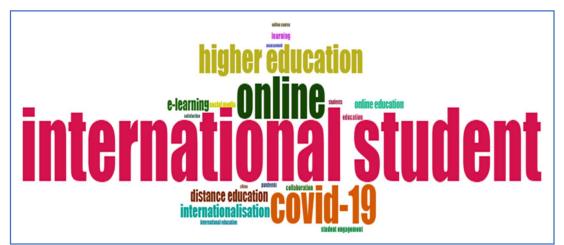


Figure 4. Word cloud of the 20 most frequently used author keywords

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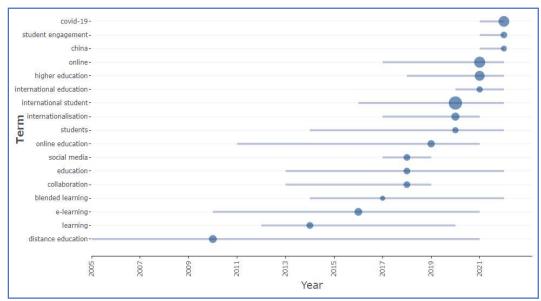


Figure 5. Tendencies of topics and author's keywords

4. CONCLUSION

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Given the spread of the unfinished global and ongoing COVID-19 pandemic and the increasingly important transfer of knowledge, the teaching and learning process must continue. Based on that, there have been many existing topics and publications related to international students in online learning, but it is still rare to analyze them bibliometrically, which is why this research was conducted. In relation to this research topic, a number of subjects and terms frequently used in this theme have the potential to be further developed, particularly in the area of international students in online learning. Researchers working on this issue may also draw upon some of the most prolific publications and authors as references or perhaps through keywords they find stimulating enough to carry out further research. As a result, it is important to motivate other academics around the world to do research related to international students and apply what they learn to the learning process in order to obtain a better and more advanced civilization and development.

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