REVISITING CLASSROOM ENVIRONMENT AND ACADEMIC PERFORMANCE OF THE STUDENTS IN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT
This paper aimed to examine higher education institutions, classroom environment, the role of teacher, and student academic performance using bibliometric analysis from 2001 to 2020. The main aim was to consolidate the published researches on the students' academic performance in higher education in the Web of Science indexed documents. There was a lack of quantitative measurements on the subject. We used the bibliometric method and a total of 2797 published documents were found. The study findings showed that the topic of 'higher education institutions' was on top with a total number of 2210 publications, 1822 articles as a type of published documents, 2447 publications in English, and a considerable increase in publications as per years were found. The top author named Lepori B was found with 202 citations and 13 articles started from 2007. Similarly, the University of Aveiro was on top organizations out of 2609, United States (US) on top out of 126 countries, and higher education as a keyword out of 6497. The Journal of Cleaner Production placed at top of sources out of 1551, and Portuguese Foundation for Science and Technology as a top funding agency. Furthermore, the trend of data is described in tables and figures.
Keywords: Higher Education Institutions, Classroom Environment, Role of Teacher, Student Academic Performance, Bibliometric Analysis.

INTRODUCTION

Higher education institutions are providing quality education to students in developing and developed countries (Balzer, 2020; De-Wit, 2020; Kim & Maloney, 2020). Along with instructional instructions, the classroom environment and role of the teacher are very important for learning outcomes among students' at all educational levels generally and at the tertiary level particularly (Altbach, Reisberg, & Rumbley, 2019; Shoaib, Abdullah, & Ali, 2020). To measure the students' academic performance in higher education institutions, multiple methods had been adopted to study the issue such as qualitative, quantitative, mixed methods, observational method, and content analysis techniques (Ali & Naveed, 2020; Ayala & Contreras, 2018; Clement & Kataeva, 2018; Lynch & Hennessy, 2017; Semela, Bekele, & Abraham, 2017; Shoaib & Ullah, 2019; Verge, Ferrer-Fons, & González, 2017). Along with these methods, different tools have also been used to measure the students' academic performance at tertiary levels (Bachan, 2017; Bagguley & Hussain, 2014; Phipps & Young, 2015; Shoaib & Ullah, 2019). However, there is a lack of bibliometric analysis techniques used employed by scholars (Peng, Zhu, & Wu, 2020; Shoaib, Abdullah, & Ali, 2021; Shoaib, Ahmad, Ali, & Abdullah, 2021). It is characterized to employ the statistical and mathematical method to books, letters, articles, proceeding papers, abstract, book reviews, and editorial materials used in scientific

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publications (Baker, Pandey, Kumar, & Haldar, 2020; Muhuri, Shukla, & Abraham, 2019; Shoaib, Ali, Anwar, Rasool, et al., 2021; Shoaib, Ali, Anwar, & Shaukat, 2021).

For instance, in the assessment of scientific performance in the field of sociology of education, citation indicators and bibliometric are very important and among the most critical impact on the measure of scientific literature (Cretu & Morandau, 2020; Shoaib, Ali, & Naseer, 2021; Shoaib, Ali, & Akbar, 2021). It is important to mention here that the term 'Bibliometrics' was coined in 1969 that means the application of statistical and mathematical methods to journals, books, and other related media of communications (Hernández-Torrano & Kuzhabekova, 2020; Huang et al., 2020; Kuzhabekova, 2021). This method has gained a lot of attention in the last decade through the important roles played in the field of library sciences discipline and evaluation of research, scientific publications, and assessment through a quantitative approach on published documents (Ali, Shoaib, & Abdullah, 2022; Kuzhabekova, 2021). Thus, the present study aimed to examine higher education institutions, classroom environment, the role of teacher, and students' academic performance using bibliometric analysis from 2001 to 2020.

Objectives of the Study

Researchers formulated the following objectives to examine electronic resources for higher education institutions, classroom environment, the role of teacher, and student academic performance using bibliometric analysis from 2001 to 2020.

1. To examine the published documents by their topics and document types
2. To find out the published documents by their language and years
3. To chalk out published documents by their top twenty results of authors' information
4. To determine the published documents by top twenty organizations and counties
5. To scrutinize published documents by top twenty keywords, sources of publications, funding agencies, and citations

REVIEW OF LITERATURE

The academic performance of students in higher education had been a serious concern across societies, both in the developing and developed world (Allam, 2020; De-Wit, 2020; Kim & Maloney, 2020). A considerable number of scientific studies had raised the concern on students' academic performance in the globe (Altbach et al., 2019; Atinaf & Petros, 2016; Dickinson-Delaporte, Gunness, & McNair, 2018; Livingston & Miller, 2014; Mangold, 2018; Shoaib & Ullah, 2019). Most of these studies concluded that the academic performance of students had not based on a single factor (Loo, 2017; Lynch & Hennessy, 2017; Mollaeva, 2017; Nogueira, Barros, & Sequeira, 2017; Shoaib, Tariq, Shahzadi, & Ali, 2022). Multiple factors were contributing including classroom environment (Blewitt & Shane, 2019; Shoaib, Anwar, & Rasool, 2022), students' home background (Boateng, Asare, Manu, Sefah, & Adomako, 2020; Shoaib, Anwar, & Mustafa, 2022), study culture (Houtte, 2004; Shoaib, Ali, Anwar, & Abdullah, 2022), the role of teacher (Anwar, Shoaib, & Mustafa, 2022; Dee, 2006), previous education (Ali et al., 2022; Selvig, Holaday, Purkiss, & Hortsch, 2015), and personal efforts (Arshad, Zaidi, & Mahmood, 2015; Shoaib & Ullah, 2021a). On the other hand, several researchers used different methodological approaches to study students' academic performance in higher education institutions including qualitative, quantitative, mixed methods, observation, content analysis, experiments, and bibliometric analysis (Ali & Naveed, 2020; Allam, 2020; Caliskan, Akin, & Engin-Demir, 2020; Du, Yang, Shelton, Hung, & Zhang, 2021; Gomez, 2020; Hayes & Findlow, 2020; Kuzhabekova, 2021; Shoaib et al., 2020; Shoaib & Ullah, 2021b; Tripathi, 2019).

It is pertinent to mention here that the bibliometric analysis technique was used by several researchers to analyze scientific productivity (Abedin, Jafarzadeh, & Olszak, 2020; Huang et al., 2020; Peng et al., 2020; Schiuma, Kumar, Sureka, & Joshi, 2020; Shoaib, Ali, Anwar, & Shaukat, 2021). This method focused to analyze published documents including books, letters, proceeding papers, book reviews, articles, abstract, and editorial materials used in scientific publications (Aparicio, Iturralde, & Maseda, 2020; Cretu & Morandau, 2020; El-Alfy & Mohammed, 2020; Hernández-Torrano & Kuzhabekova, 2020; Shoaib, Abdullah, et al., 2021; Shoaib, Ali, Anwar, Rasool, et al., 2021). As Ivanović and Ho (2019) pointed out highly cited articles in the educational category using bibliometric analysis. Similarly, Yanniris and Huang (2018) asserted empirical knowledge produced in the field of environmental education through bibliometric analysis. Further, Peng et al. (2020) revealed in the domain of intercultural competence research by visualizing the knowledge employing

bibliometric analysis. Likewise, the study of Huang et al. (2020) concluded the evolution of topics in the field of educational research employing systematic review and used bibliometric method. Moreover, the results of Hernández-Torrano and Kuzhabekova (2020) also asserted the development and state of research in the field of education employing bibliometric analysis over 60 years. Besides, Cretu and Morandau (2020) concluded in their study using bibliometric analysis of educational research on teacher education for inclusive education. It was also reported that several studies had been employed bibliometric analysis to examine the published documents including article, books, abstracts, letters, and other related scientific documents (Aparicio et al., 2020; El-Alfy & Mohammed, 2020; Goksu, Ozkaya, & Gunduz, 2020; Ivanović & Ho, 2019; Muhuri et al., 2019). Thus, based on the review of literature, this study aimed to examine scientific documents on higher education institutions, classroom environment, the role of teacher, and student academic performance using bibliometric analysis from 2001 to 2020.

MATERIALS AND METHODS

For the present study, researchers used the bibliometric analysis technique to conduct the present study. For bibliometric analysis, researchers extracted data from the Science Citation Index database, Web of Science (Core Collection). researchers used search query as TITLE: ("Role of teacher") OR TITLE: ("Student academic performance") OR TITLE: ("Higher education institutions") OR TITLE: ("Classroom environment") with a period of 2001 to 2020. With the help of these queries, a total of 2797 published documents were found and further analysis was employed. The indexes in the core collection of Web of Science were SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, and IC. The data was extracted on February 02, 2021, at 01:00 PM (GMT). Researchers used Biblioshiny, VOSviewer, and MS Excel software for bibliometric analysis. Further, data was presented in tables and figures to show the results, and a conclusion was drawn.

RESULTS AND DISCUSSIONS

This section provides the results derived from bibliometric analysis of 2001-2020 on students' academic performance in higher education. Further, this section is divided into different sections based on the objectives of the study along with discussion.

Objective 1: To examine the published documents by their topics and document types on the subject under hand during 2001-2020

Table 1 described the distribution of published documents by their topics and document types from 2001 to 2020. Section-a of the table was focused on the topic of the document. Data in the table revealed that 79.01 percent of the published documents were on higher education institutions and 9.76 percent of the publications were on classroom environment during 2001-2020. On the other hand, there was a smaller portion of published documents title on the role of the teacher (7.33%) and student academic performance (3.9%). It asserted that the majority (79.01%) of the published documents were on higher education institutions topic (*See Table 1*). Thus, higher education institutions were a very important topic for authors and used as a topic for publication. The study findings were also supported by the findings of Earp (2010) and Thanuskodi (2010).

Table 1

Distribution of Published Documents by Their Topics and Document Types (2001-2020)

a) Topic of the documents (2001-2020)	Total Publications	Percentage
Higher education institutions	2210	79.01
Classroom environment	273	09.76
Role of teacher	205	07.33
Student academic performance	109	03.9
Total	2797	100.00
b) Type of the documents (2001-2020)	Total Publications	Percentage
Article	1822	65.14
Proceedings Paper	813	29.07
Review	52	01.86
Editorial Material	41	01.47
Meeting Abstract	40	01.43
Book Review	18	00.64

Letter	07	00.25
Correction	04	00.14
Total	2797	100.00

Section-b of table 1 highlighted the type of the published documents during 2001-2020. There were 65.14 percent of the published documents were in article form and 29.07 percent of documents were as proceedings papers during 2001-2020. Similarly, 1.86 percent of the documents were published as a review and only 0.14 percent of them were named as a letter. Further, a similar proportion of published documents were reported as editorial material (1.47%) and meeting abstract (1.43%). Based on the data, it concluded that more than half of the published documents were published as an article. Hence, the article as a document was very important for authors and published during 2001-2020. Furthermore, the study findings were aligned with the findings of Yanniris and Huang (2018).

Objective 2: To find out the published documents by their language and years on the subject under hand during 2001-2020

Table 2 described the distribution of published documents by their language and year of publication from 2001 to 2020. Section-a of the table was focused on the language of the document. Data in the table revealed that 87.487 percent of the documents were published in the English language and 4.719 percent of the publications were published in the Spanish language during 2001-2020. On the other hand, there was a smaller portion of published documents in the language of Chinese (0.143%), German (0.215%), and French (0.215%). However, a similar proportion of published documents was reported in Bulgarian and Malay language as 0.107 percent. Further, documents published in the language of Czech, Latvian, Lithuanian, and Ukrainian were also reported as parallel proportion i.e., 0.072. Nonetheless, among the top twenty languages of published documents, there was a similar and smaller proportion of Afrikaans, Arabic, Catalan, Dutch, Italian, Korean, Norwegian, and Slovak reported as 0.036 percent. It asserted that the majority (87.487%) of the published documents were published in the English language during 2001-2020. Thus, the English language was very important for authors and used as a language of published documents. It is pertinent to mention here that the English language is an international language (*See Table 2*). Thus, the authors selected this language for wider readership for their research documents. The study findings were also supported by the findings of Ivanović and Ho (2019).

Section-b of the table was focused on the distribution of publications by their years. Data in the table revealed that 12.656 percent of the documents were published in 2020 and 13.371percent of the publications were published in 2019. On the other hand, there was a smaller portion of published documents in the year 2018 (11.334%), 2017 (10.583%), 2016 (7.758%), and 2015 (6.793%). However, a smaller proportion of published documents was also reported in the year 2003 (0.322%) and 2002 (0.501%). However, a similar proportion of published documents was reported in 2001 and 2004 (0.644%). It affirmed that a higher number of documents (728 in numbers) were published in 2019 and 2020 as compared to other years (*See Table 2*). The study findings were also supported by the findings of Muhuri et al. (2019) and Abedin et al. (2020).

Table 2

Distribution of Published Documents by Their Language and Years (2001-2020)

a) Published documents by their language (2001-2020)

Languages	TP*	% of 2797	Languages	TP*	% of 2797
English	2447	87.487	Czech	02	00.072
Spanish	132	04.719	Latvian	02	00.072
Portuguese	86	03.075	Lithuanian	02	00.072
Russian	60	02.145	Ukrainian	02	00.072
Turkish	15	00.536	Afrikaans	01	00.036
Polish	11	00.393	Arabic	01	00.036
Croatian	08	00.286	Catalan	01	00.036
French	06	00.215	Dutch	01	00.036
German	06	00.215	Italian	01	00.036
Chinese	04	00.143	Korean	01	00.036
Bulgarian	03	00.107	Norwegian	01	00.036

| Malay | 03 | 00.107 | Slovak | 01 | 00.036 |

TP* = Total Publication

b) Published documents by their years (2001-2020)

Years	Publications	Percentage	Years	Publications	Percentage
2001	18	00.644	2011	138	04.934
2002	14	00.501	2012	162	05.792
2003	09	00.322	2013	149	05.327
2004	18	00.644	2014	164	05.863
2005	36	01.287	2015	190	06.793
2006	47	01.680	2016	217	07.758
2007	40	01.430	2017	296	10.583
2008	73	02.610	2018	317	11.334
2009	83	02.967	2019	374	13.371
2010	98	03.504	2020	354	12.656

Objective 3: To chalk out published documents by their top twenty results of authors' information on the subject under hand during 2001-2020

Table 3 described the distribution of published documents by their top twenty results out of a total of 6598 authors' information from 2001 to 2020. It is pertinent to mention here that single-authored documents were 589 and multi-authored documents were found as 6009 in numbers. Data in the table revealed that the top author name was Lepori B having h_index 0f 9, g_index 0f 13, m_index of 0.6, total citations 202, with 13 publications starting from 2007. Similarly, Carvalho T had 7 publications with 110 citations, Leal W had 7 publications with 47 citations, and Soon NK had only 6 publications with 7 citations starting from 2015. Conversely, the author named Nazem F appeared in the top twenty authors with 5 publications and zero citations starting from 2008. It stated that an author named Lepori B was at top of the authors' information list with 13 publications and 202 citations (*See Table 3*). The study findings were also supported by the findings of Aparicio et al. (2020) and Baker et al. (2020)

Table 3

Distribution of Published Documents by Their Top Twenty Results of Authors' Information (2001-2020)

Author	h_index	g_index	m_index	TC*	TP*	PY_Start
Lepori B	9	13	0.6	202	13	2007
Carvalho T	5	7	0.313	110	7	2006
Leal W	4	6	0	47	7	2019
Seeber M	4	7	0.4	110	7	2012
Dorman JP	4	6	0.19	40	6	2001
Lozano R	5	6	0.714	203	6	2015
Prathap G	4	5	0.4	25	6	2012
Rothmann S	4	6	0.222	151	6	2004
Salvia AL	4	6	0	46	6	2019
Soon NK	1	2	0.143	7	6	2015
Van Houtte M	4	6	0.4	148	6	2012
Ahmad A	2	2	0.333	9	5	2016
Avila LY	2	4	0.25	20	5	2014
Chan TW	2	5	0.118	53	5	2005
Daraio C	2	5	0.133	72	5	2007
Ishak MH	2	4	0.2	20	5	2012
Johnes G	4	5	0.308	180	5	2009
Nazem F	0	0	0	0	5	2008

| Qasem Y | 2 | 3 | 0.5 | 10 | 5 | 2018 |
| Rosa MJ | 2 | 5 | 0.25 | 41 | 5 | 2014 |

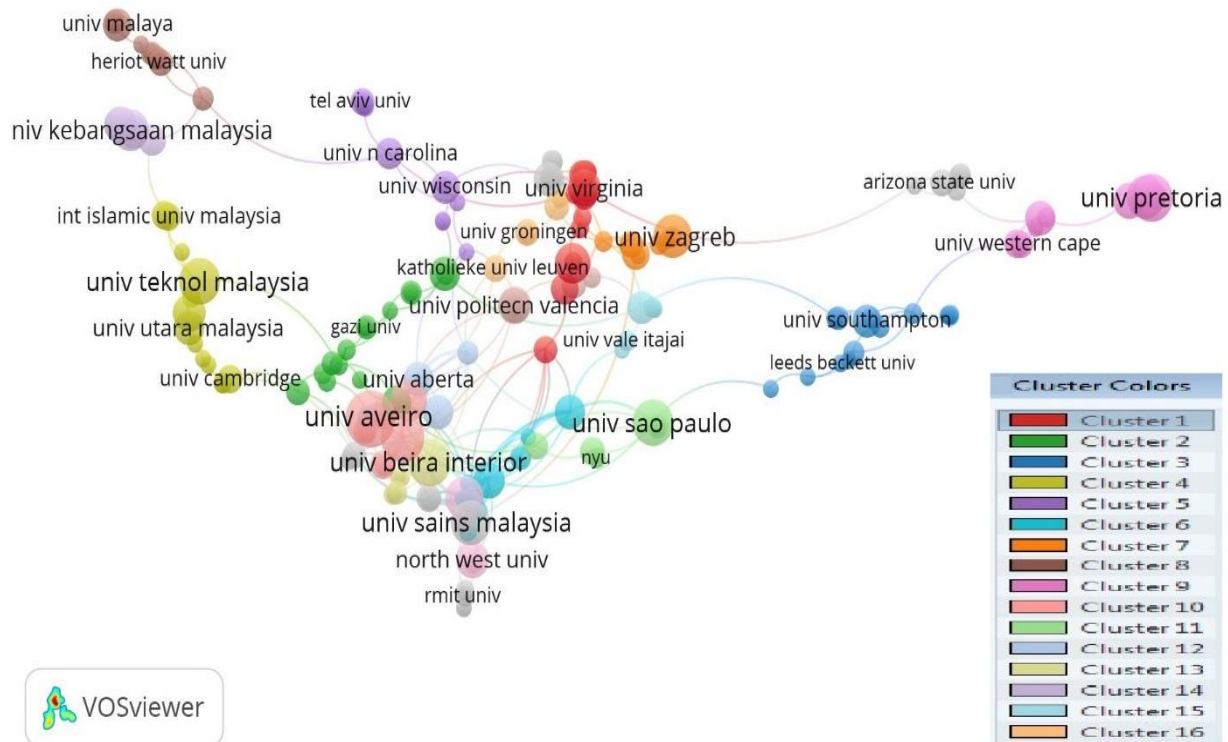TC* = Total Citations, TP* = Total Publication

Figure 1. Published Documents by Top Twenty Organizations (2001-2020)

Objective 4: To determine the published documents by top twenty organizations and counties on the subject under hand during 2001-2020

Table 4 revealed the top twenty names out of 2609 organizations and countries (126 in total numbers) based on published documents during 2001-2020. Section-a of the table was based on the top twenty organizations. Data indicated that the University of Aveiro was at the top of the list with 26 number of published documents (0.93% out of 2797. In second place, the University of Lisbon was standing with 21 publications from 2001 to 2020. Further, the University of Beira Interior and the University of Pretoria had the same number of publications i.e., 19 in number. On the other hand, the name of Hamburg Univ. Appl. Sci. was at bottom of the top twenty organizational published documents from 2001 to 2020 (*See Table 4 & Figure 1*). It is important to mention here that several studies reported the name of top organizations based on published documents (Cretu & Morandau, 2020; El-Alfy & Mohammed, 2020; Goksu et al., 2020).

Table 4

Distribution of Published Documents by Top Twenty Organizations and Counties (2001-2020)

a) List of publications by top twenty organizations (2001-2020)					
Organization	TP*	% of 2797	Organization	TP*	% of 2797
Univ. Aveiro	26	0.93	Univ. Coimbra	14	0.501
Univ. Lisbon	21	0.751	Univ. Kebangsaan Malaysia	14	0.501
Univ. Beira Interior	19	0.679	Beijing Normal Univ.	13	0.465
Univ. Pretoria	19	0.679	Univ. Ghent	13	0.465
Univ. Sao Paulo	18	0.644	Islamic Azad Univ.	12	0.429
Univ. Teknol Malaysia	18	0.644	North West Univ.	12	0.429
Univ. Sains Malaysia	17	0.608	Univ. Politecn Valencia	12	0.429

Manchester Metropolitan Univ.	16	0.572	Univ. Tun Hussein Onn Malaysia	12	0.429
Univ. Zagreb	16	0.572	Univ. Virginia	12	0.429
Univ. South Africa	15	0.536	Hamburg Univ. Appl. Sci.	11	0.393

b) List of publications by top twenty counties (2001-2020)

Country	TP*	% of 2797	SCP	MCP	MCP_Ratio
United States (US)	286	0.11154	266	20	0.0699
China	179	0.06981	160	19	0.1061
United Kingdom	159	0.06201	121	38	0.239
Brazil	146	0.05694	122	24	0.1644
Malaysia	114	0.04446	97	17	0.1491
Portugal	107	0.04173	92	15	0.1402
South Africa	103	0.04017	95	8	0.0777
Russia	95	0.03705	92	3	0.0316
Spain	89	0.03471	77	12	0.1348
Australia	67	0.02613	57	10	0.1493
India	63	0.02457	56	7	0.1111
Turkey	61	0.02379	54	7	0.1148
Germany	55	0.02145	47	8	0.1455
Mexico	49	0.01911	42	7	0.1429
Colombia	48	0.01872	40	8	0.1667
Poland	48	0.01872	44	4	0.0833
Romania	47	0.01833	42	5	0.1064
Croatia	43	0.01677	40	3	0.0698
Indonesia	38	0.01482	31	7	0.1842
Pakistan	34	0.01326	29	5	0.1471

Section-b of table 4 was focused on the list of publications by the top twenty countries from 2001 to 2020. Data in the table revealed that 0.11154 percent of the documents were published in the United States and 0.06981 percent of the publications were published in China during 2001-2020. On the other hand, there was a smaller portion of published documents in the United Kingdom (0.06201%), Brazil (0.05694%), and Malaysia (0.04446%). However, a similar proportion of published documents was reported in Colombia and Poland as 0.01872 percent. Further, documents published in Indonesia (0.01482%), Croatia (0.01677%), Romania (0.01833%), and Mexico (0.01911%) were also reported in the top twenty countries. Nonetheless, among the top twenty languages of published documents, there was a smaller proportion of Pakistan i.e., 0.01326 percent out of 2797 documents. It asserted that the name of the US was on top of twenty countries based on published documents from 2001 to 2020. As the US was English speaking country and used English as a language of published documents. It is pertinent to mention here that the English language is an international language and the US was on top of twenty countries based on publications on the subject underhand (*See Table 4 & Figure 2*). Thus, the authors selected their language for wider readership for their research documents. The study findings were also supported by the findings of Huang et al. (2020) and Schiuma et al. (2020).
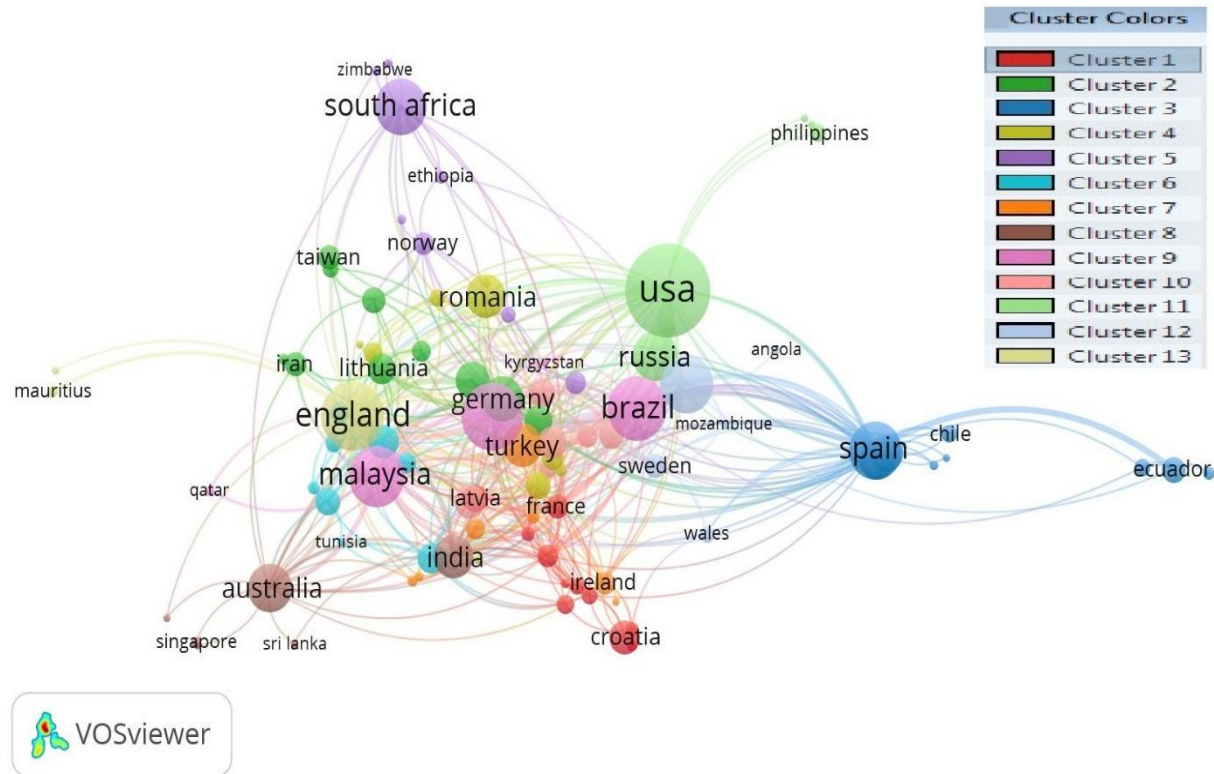
Figure 2. Published Documents by Top Twenty Counties (2001-2020)

Objective 5: To scrutinize published documents by top twenty keywords, sources of publications, funding agencies, and citations on the subject under hand during 2001-2020

Table 5 presented the top twenty keywords used in the published documents during 2001-2020. Data in the table pointed out that higher education was on the top of the top twenty keywords with a total number of 492 and higher education institutions placed at second number with a total number of 351 as occurrence. Similarly, universities used as keyword 67 times and university as 55 times in the published documents from 2001 to 2020. Further, sustainability, education, sustainable development, quality assurance, quality, management, knowledge management, students, innovation, evaluation, e-learning, efficiency, and governance was also used as the top twenty keywords in a published document in the said period of publication. However, governance and strategy were used as lowest as a keyword in the top twenty keywords in published documents in 20 years. It is important to mention here that the total keywords were 6497 in the number used in the published documents. The keywords as higher education and higher education institutions were on the top of the list of top twenty keywords (*See Table 5 & Figure 3*). The study findings are aligned with the findings calculated keywords in the published documents such as Kuzhabekova (2021), El-Alfy and Mohammed (2020), and Aparicio et al. (2020).

Table 5

Distribution of Published Documents by Top Twenty Keywords (2001-2020)

Keywords	Frequency	TLS*	Keyword	Frequency	TLS*
Higher Education	492	642	Management	32	67
Higher Education Institutions	351	425	Knowledge Management	32	58
Universities	67	130	Students	35	56
University	55	107	Innovation	30	53
Sustainability	54	101	Evaluation	24	48
Education	44	89	E-Learning	32	46
Sustainable Development	42	81	Efficiency	23	42

Quality Assurance	35	74	Governance	16	39
Quality	33	72	Higher Education Institutions (HEIs)	26	38
Higher Education Institution	61	67	Strategy	16	38

<div align="center">TLS* = Total Link Strength</div>

Figure3. Published Documents by Top Twenty Keywords (2001-2020)

As well as the concern of sources of publications, Journal of Cleaner Production placed at top of sources out of 1551 with h_index of 14, g_index of 24, m_index of 1.272727273, total citations of 609, total publications 27, and publication year starting from 2011. Further, Higher Education was placed at second number with h_index of 13, g_index of 22, total citations of 512, total publications 34, and publication year starting from 2002. However, Quality Assurance in Education was placed at bottom of sources of top twenty published documents during 2001 to 2020 with h_index of 4, g_index of 6, m_index of 0.444444444, total citations of 48, total publications 10, and publication year starting from 2013. It is pertinent to mention here that the Journal of Cleaner Production was placed at the top and Quality Assurance in Education placed at bottom of the top twenty sources of published documents (*see Figure 4, Appendix A, Table 6*). The study findings are aligned with the findings of several researchers' analyzed top sources of published documents.
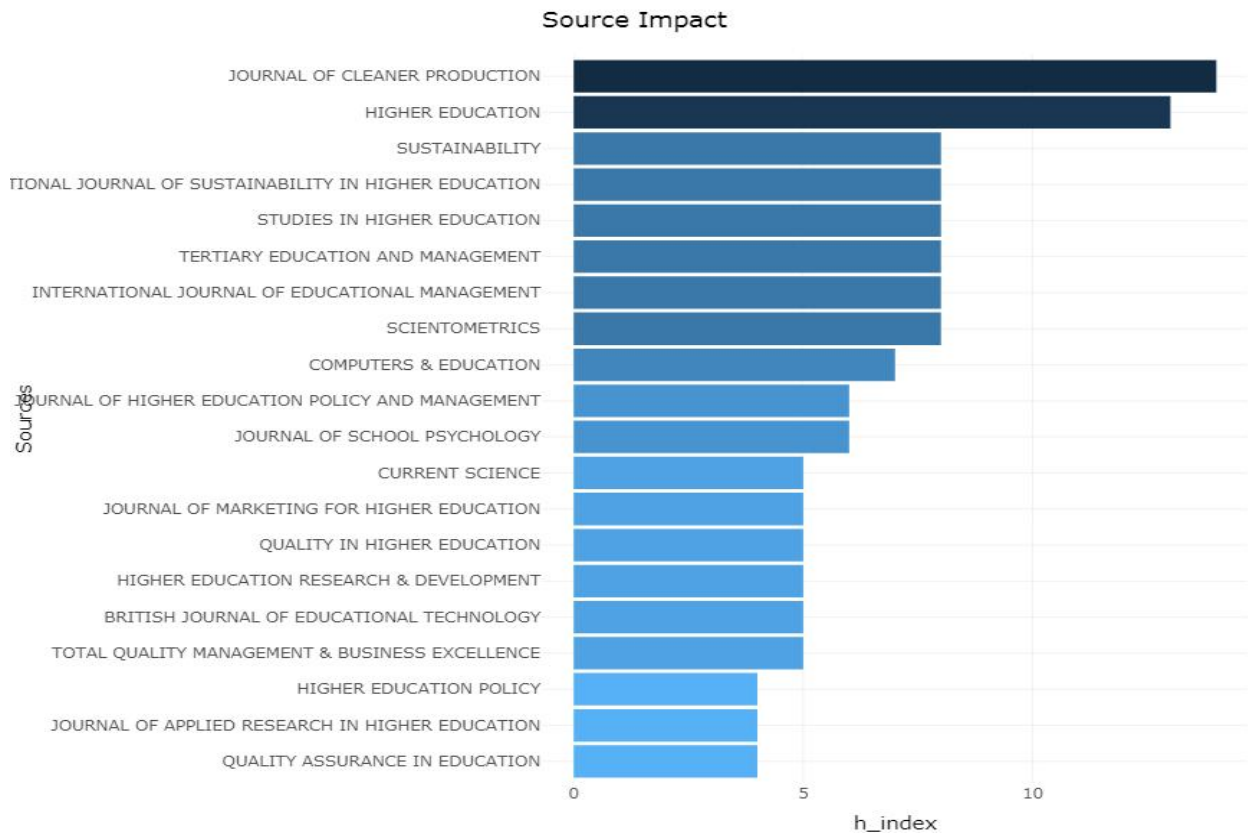
Figure 4. Published Documents by Top Twenty Sources of Publications (2001-2020)

Further, the Portuguese Foundation for Science and Technology was in the top list of Published Documents by Top Twenty Funding Agencies during 2001-2020. Similarly, CAPES, European Union EU, and National Natural Science Foundation of China NSFC was placed at second position with 0.465 percent of 2797 in published documents. On the other hand, the Australian Research Council and European Social Fund ESF with the same proportion (0.179% out of 2797) were placed at bottom of the top twenty funding agencies/organizations of published documents from 2001 to 2020 (*see Appendix B, Table 7*). As well as the concern of the top twenty articles with citations, an article titled, 'perceptions of the classroom environment, achievement goals, and achievement outcomes' [written by Church, MA; Elliot, AJ; Gable, SL in 2001, ISSN-0022-0663, Vol./No. 93(1)] with total citations of 433 was listed at top of the list during 2001-2020. Conversely, an article titled, 'implementing an international approach to English pronunciation: the role of teacher attitudes and identity' [written by Jenkins, J in 2005, ISSN-0039-8322, Vol./No. 39(3)] with total citations of 90 was placed at bottom of the top twenty published documents during the said time period (*see Appendix C, Table 8*).

CONCLUSION

Based on the bibliometric analysis, researchers reached the conclusion that this method enabled researchers to gain more in-depth insights into the selected topic and support to recognize variables that were used during research in the students' academic performance in higher education institutions. The study was mainly based to examine higher education institutions, classroom environment, the role of teacher, and students' academic performance-oriented published documents indexed in Web of Science from 2001 to 2020. It concluded that the topic of 'higher education institutions' was on top with a total number of 2210 publications in form of articles in the English language from the US. Further, the top author's name was Lepori B and the University of Aveiro was of the top organizations. The keyword 'higher education' was highly used and the top publications were in the 'Journal of Cleaner Production' and the Portuguese Foundation for Science and Technology as a top funding agency. It is recommended that further bibliometric studies may be conducted from other databases and using other students' academic performance in higher education-related topics.

Limitations of the Study

The present bibliometric study was based on publications in the Web of Science only and researchers did not use other databases agencies. Further, it only focussed to examine higher education institutions, classroom environment, the role of teacher, and student academic performance using bibliometric analysis from 2001 to 2020. Thus, researchers did not use other related topics including study culture, students' family, parental involvement, and gender, etc.

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APPENDIX-A

Table 6
Distribution of Published Documents by Top Twenty Sources of Publications (2001-2020)

Sources	h_index	g_index	m_index	TC*	TP*	PY*_Start
Journal of Cleaner Production	14	24	1.272727273	609	27	2011
Higher Education	13	22		512	34	2002
Sustainability	08	13	0.888888889	230	43	2013
International Journal of Sustainability in Higher Education	08	12		174	26	2010
Studies in Higher Education	08	11		160	24	2009
Tertiary Education and Management	08	12	0.533333333	177	23	2007
International Journal of Educational Management	08	12		168	22	2007
Scientometrics	08	13	0.571428571	190	13	2008
Computers & Education	07	07	0.411764706	233	07	2005
Journal of Higher Education Policy and Management	06	09		89	12	2009
Journal of School Psychology	06	09	0.333333333	337	9	2004
Current Science	05	07	0.384615385	57	12	2009
Journal of Marketing for Higher Education	05	12		145	12	2009
Quality in Higher Education	05	11		121	12	2008
Higher Education Research & Development	05	07	0.714285714	60	08	2015
British Journal of Educational Technology	05	05	0.333333333	108	05	2007
Total Quality Management & Business Excellence	05	05	0.263157895	70	05	2003
Higher Education Policy	04	07		61	14	2011
Journal of Applied Research in Higher Education	04	07		50	14	2012
Quality Assurance in Education	04	06	0.444444444	48	10	2013

TC* = Total Citations, TP* = Total Publications, PY* = Publication Year

APPENDIX-B

Table 7
Distribution of Published Documents by Top Twenty Funding Agencies (2001-2020)

Funding agencies	TP*	% of 2797
Portuguese Foundation for Science and Technology	27	0.965
CAPES	13	0.465
European Union EU	13	0.465
National Natural Science Foundation of China NSFC	13	0.465
Economic Social Research Council ESRC	12	0.429
National Institutes Of Health NIH USA	12	0.429
United States Department Of Health Human Services	12	0.429
National Science Foundation NSF	09	0.322
European Commission	08	0.286
European Commission Joint Research Centre	08	0.286
Federal Ministry of Education Research BMBF	08	0.286
Grants in Aid for Scientific Research Kakenhi	07	0.250
Japan Society for The Promotion of Science	07	0.250

Ministry of Education Culture Sports Science and Technology Japan MEXT	07	0.250
National Council for Scientific and Technological Development CNPQ	07	0.250
NIH Eunice Kennedy Shriver National Institute of Child Health Human Development NICHD	06	0.215
US Department of Education	06	0.215
Australian Research Council	05	0.179
European Social Fund ESF	05	0.179
TP* = Total Publication		

APPENDIX-C

Table 8
Distribution of Top Twenty Journal Articles by Citations (2001-2020)

Article title	Authors	ISSN	Vol./No.	PY	TC
Perceptions of classroom environment, achievement goals, and achievement outcomes	Church, MA; Elliot, AJ; Gable, SL	0022-0663	93(1)	2001	433
The classroom environment and students' reports of avoidance strategies in mathematics: A multimethod study	Turner, JC; Midgley, C; Meyer, DK; Gheen, M; Anderman, EM; Kang, Y; Patrick, H	0022-0663	94(1)	2002	319
The relation of kindergarten classroom environment to teacher, family, and school characteristics and child outcomes	Pianta, RC; La Paro, KM; Payne, C; Cox, MJ; Bradley, R	0013-5984	102(3)	2002	303
How to Improve Teaching Practices: The Role of Teacher Motivation, Organizational Factors, and Leadership Practices	Thoonen, EEJ; Sleegers, PJC; Oort, FJ; Peetsma, TTD; Geijsel, FP	0013-161X	47(3)	2011	195
The relation of global first-grade classroom environment to structural classroom features and teacher and student behaviors	Natl Inst Child Hlth Human Dev Ear	0013-5984	102(5)	2002	180
Classroom environment influences on aggression, peer relations, and academic focus	Barth, JM; Dunlap, SI; Dane, H; Lochman, JE; Wells, KC	0022-4405	42(2)	2004	152
Effect of online social networking on student academic performance	Paul, JA; Baker, HM; Cochran, JD	0747-5632	28(6)	2012	138
Environmental Management Systems (EMS) implementation processes and practices in European higher education institutions - Top-down versus participatory approaches	Disterheft, A; Caeiro, SSFD; Ramos, MR; Azeiteiro, UMD	0959-6526	31	2012	132
The Motivational Effects of the Classroom Environment in Facilitating Self-Regulated Learning	Young, MR	0273-4753	27(1)	2005	133
Establishing sustainability science in higher education institutions: towards an integration of academic development, institutionalization, and stakeholder collaborations	Yarime, M; Trencher, G; Mino, T; Scholz, RW; Olsson, L; Ness, B; Frantzeskaki, N; Rotmans, J	1862-4065	7	2012	128
Does Math Self-Efficacy Mediate the Effect of the Perceived Classroom Environment on Standardized Math Test Performance?	Fast, LA; Lewis, JL; Bryant, MJ; Bocian, KA; Cardullo, RA; Rettig, M; Hammond, KA	0022-0663	102(3)	2010	115
The Role of Teacher Immediacy as a Motivational Factor in Student Learning: Using Meta-Analysis to Test a Causal Model	Allen, M; Witt, PL; Wheeless, LR	0363-4523	55(1)	2006	111
Experiences from the implementation of sustainable development in higher education institutions: Environmental Management for Sustainable Universities	Ramos, TB; Caeiro, S; van Hoof, B; Lozano, R; Huisingh, D; Ceulemans, K	0959-6526	106	2015	111

Article title	Authors	ISSN	Vol./No.	PY	TC
Negative peer perceptions of obese children in the classroom environment	Zeller, MH; Reiter-Purtill, J; Ramey, C	1930-7381	16(4)	2008	107
Measuring the research performance of Chinese higher education institutions using data envelopment analysis	Johnes, J; Yu, L	1043-951X	19(4)	2008	107
Organizational and personal predictors of teacher commitment: The mediating role of teacher efficacy and identification with school	Chan, WY; Lau, S; Nie, Y; Lim, S; Hogan, D	0002-8312	45(3)	2008	106
Lean Six Sigma for higher education institutions (HEIs) Challenges, barriers, success factors, tools/techniques	Antony, J; Krishan, N; Cullen, D; Kumar, M	1741-0401	61(8)	2012	108
Educational and Career Interests in Math: A Longitudinal Examination of the Links Between Classroom Environment, Motivational Beliefs, and Interests	Wang, MT	0012-1649	48(6)	2012	94
Predicting student academic performance in an engineering dynamics course: A comparison of four types of predictive mathematical models	Huang, S; Fang, N	0360-1315	61	2013	96
Implementing an international approach to English pronunciation: The role of teacher attitudes and identity	Jenkins, J	0039-8322	39(3)	2005	90

TC* = Total Citations, PY* = Publication Year