Bibliometric Analysis of The Development Map and Research Directions of Blanded Learning on Scopus Database (2013-2024)

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Abstract

This inquire about points to decide the advancement and heading of Blanded Learning inquire about in distributions recorded by Scopus. This inquire about employments bibliometric investigation strategies to investigate all distributions ordered within the Scopus database on Blanded Learning from 2013 to 2024. Information analyzed utilizing Exceed expectations and R/R-Studio. VOSviewer is utilized to perform visual investigation of the concurrent event of watchwords and archive cites. The creator found 2,357 distributions that coordinated the work, subject and criteria indicated. The comes about of this investigate appear an yearly development rate of 355 with the foremost distributions on Blanded Learning in 2022.

United States is the nation that contributes the foremost distributions with connection from Brigham Youthful Graham, CR being the foremost profitable author on the topic of Blanded Learning. The bibliometric analysis carried out was constrained to Scopus information. Other national and universal databases were not taken into consideration in this think about. This think about presents a brief diagram of the writing open to analysts and gives proposals for future investigate.

Introduction Section

In the era of industrial revolution 4.0 which is marked by technological progress (Lei, 2023; Mahmud et al., 2022). In progress technology very influential on renewal system education (Baguma and Wolters, 2021; Dimic et al., 2019; Han et al., 2022). In progress technology necessity adaptation education in the resolution era of industry 4.0 and society 5.0 (Lee et al., 2018). One of from renewal influenced education by development technology is system blended learning (Lee et al., 2018). Blended learning is learning thatcombines the delivery of learning using face-to-face activities, and computer-based learning both offline andonline (Alkhurayyif, 2023; Singh et al., 2022; Yu and Peng, 2023). One of the peak causes of blended learning will be in 2022 due to the Covid-19 outbreak (Abdulkareem et al., 2022; Casillano, 2022; Graham etal., 2023; Romaniuk and Łukasiewicz-Wieleba, 2022). In the learning process, implementing blended learning requires an application. One of them that can be used is schoolology (Alshahrani, 2023; Ariza, 2023;Nguyen et al., 2023; Wang et al., 2024).

Thus, teachers need to motivate students to increase interest in learning through a blended learning system (Ariza, 2023; Koh and Ahn, 2023; Li and Huang, 2023; Suriagiri et al., 2022). Educators in choosing learning approaches and strategies must be appropriate and in accordance with the education system (Al-Jarrah et al., 2021; El Sayary, 2023; Sarimanah et al., 2019), so that the learning process is not monotonous and boring. Because technological advances not only make education easier, but also influenceinterest and many negative effects of technology for children who are not yet mature in the correct use of technology (Alex et al., 2024; Guo, 2023; Makovec Radovan and Radovan, 2023).

Students' supervision of technology use must be considered (Regueiro et al., 2017; Yağcı, 2018; Zigh et al., 2022). There are many negative impacts encountered in this technological advancement through social media (Iqbal et al., 2022; Zheng et al., 2022; Zhong et al., 2022). Therefore, teachers and parents must supervise students in using mass media, so that they are used properly (Manca and Ranieri, 2016; Olofsson et al., 2017).

Apart from negative impacts, technological advances also have positive impacts on users, one of which is the ease of accessing all forms of information (Amponsah et al., 2021; Mudau et al., 2022; Shi et al., 2022; Singh, 2022). One example of social media that can be used well in searching for information is Google (Devi and Mohan, 2023; Francom et al., 2021; Manipatruni et al., 2023; Zitha et al., 2023), Scopus (Abuhassna et al. , 2023; Hairi et al., 2022; Li and Wong, 2022) . Not only in searching for information, mass media also facilitates the learning process (Dumitru et al., 2023; Scherer et al., 2023; Shaw et al., 2023; Wang et al., 2024). And one of the social media that makes the learning process easier is Schoology, Google Classroom (Akayoğlu, 2021; Hairi et al., 2022; Le, 2020; Lugya, 2018), Facebook (Baguma and Wolters, 2021; Chaiprasurt et al., 2022; Rojprasert et al., 2020; Sutherland et al., 2023), etc.

The many positive and negative influences in technological progress led the author to analyze using bibliometrics a map of the development and direction of blended learning research on the Scopus database.

Method

Bibliometric examination strategies were utilized in this inquire about. Information was gotten employing aBoolean look motor to comb the Scopus database between 2013 and 2024. The look was carried out on December 15 2023 at 16.08 WIB. Analysts utilize gadgets R and Rstudio, VosViewer and Microsoft Exceedexpectations for analyzing citations, archive substance and systems. Analysts took three stages in handling the dataset.

In the primary arrange, analysts will conduct a writing audit of related topics to guarantee significant investigate is carried out on bibliometric points. Separated from that, a writing audit is valuable for deciding suitable watchwords that are considered to speak to the scope of the investigate.

Second organize, At this arrange the analyst utilized the boolean administrator TITLE-ABS-KEY (blended AND learning) to perform a look on Scopus which yielded 18,580 archives. Another, filtration is carried out with the boolean administrators (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (Dialect , "english")) AND (LIMIT-TO (SRCTYPE , "j")) to constrain as it were articles as sort article reports, source records were as it were diaries and as it were articles in English, coming about in a last report of 2,357.

The third organize, examination was carried out on the ultimate look documents using Scopus analyzer and R and Rstudio to decide the number of records per year, records by diary, creator, connection, nation and subject/field. Another, investigation was carried out at the archive arrange level with visualization by means of VOSviewer and Microsoft Exceed expectations information handling.

This inquire about procedure can be seen within the taking after picture (x):

Table 1. This research procedure can be seen in the following image (x).
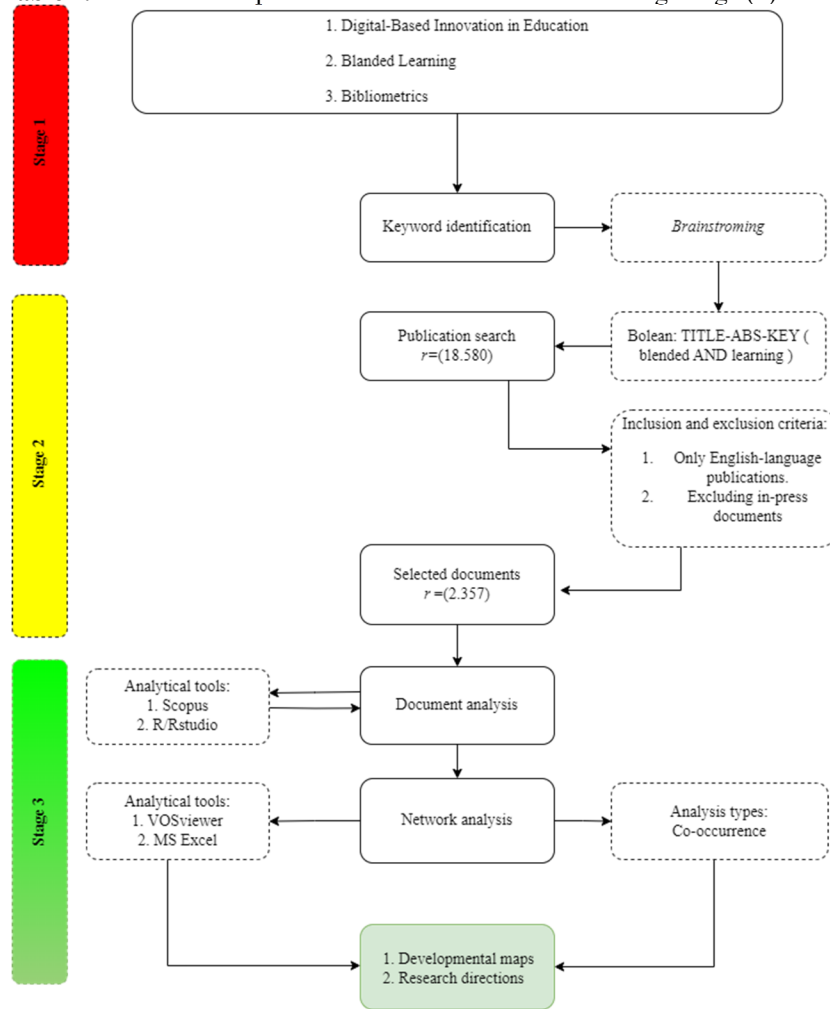
1. Results and Discussion

Document Analysis

Key Information About Data (Taken from Bib-Shy)

Table 2 provides an overview of the 2.357 documents collected over 11 years. Includes 5.963 authors, 400 single authors, 15,57 % international authorship collaboration, 92.120 references with an average citation per document of 23,1 citations.

Table 2. Documents by year (taken from Scopus)

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2000:2024

Sources (Journals, Books, etc)	445
Documents	2357
Annual Growth Rate %	9,59
Document Average Age	4,85
Average citations per doc	23,1
References	92120
DOCUMENT CONTENTS	
Keywords Plus (ID)	5237
Author's Keywords (DE)	5704
AUTHORS	
Authors	5963
Authors of single-authored docs	400
AUTHORS COLLABORATION	
Single-authored docs	438
Co-Authors per Doc	3,02
International co-authorships %	15,57
DOCUMENT TYPES	
article	2357

Documents By Year

Figure From 2013 to 2024 in table 3, documents stagnated in 2015 because there were only 67 documents published. However, from that year, 2022 will experience the peak of published documents from 2014 to 2024, namely 355 documents. This is because in 2022 there will be a pandemic caused by the corona outbreak throughout the world. So a lot of education and daily activities have been shifted to online and blended learning.
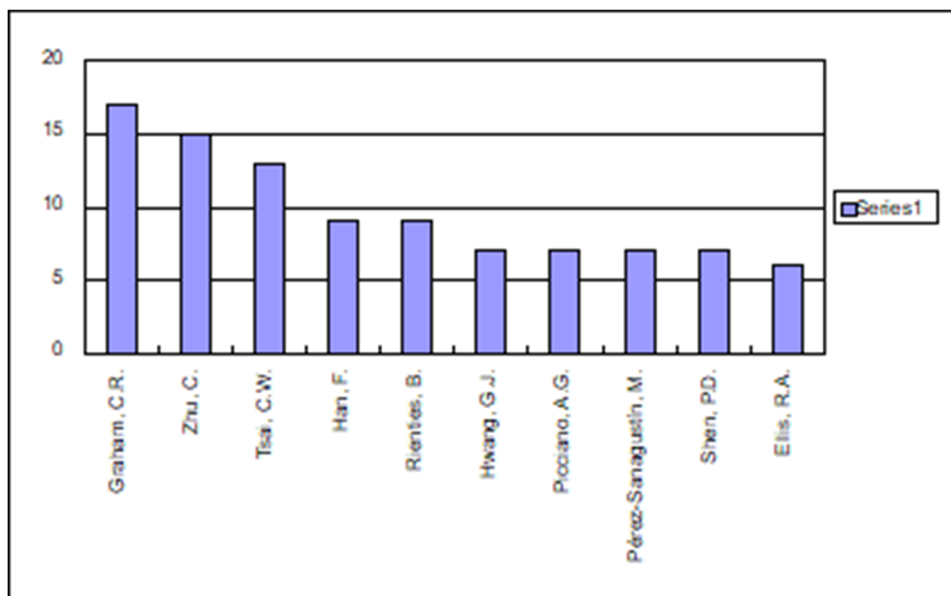
Table 3. Documents by year
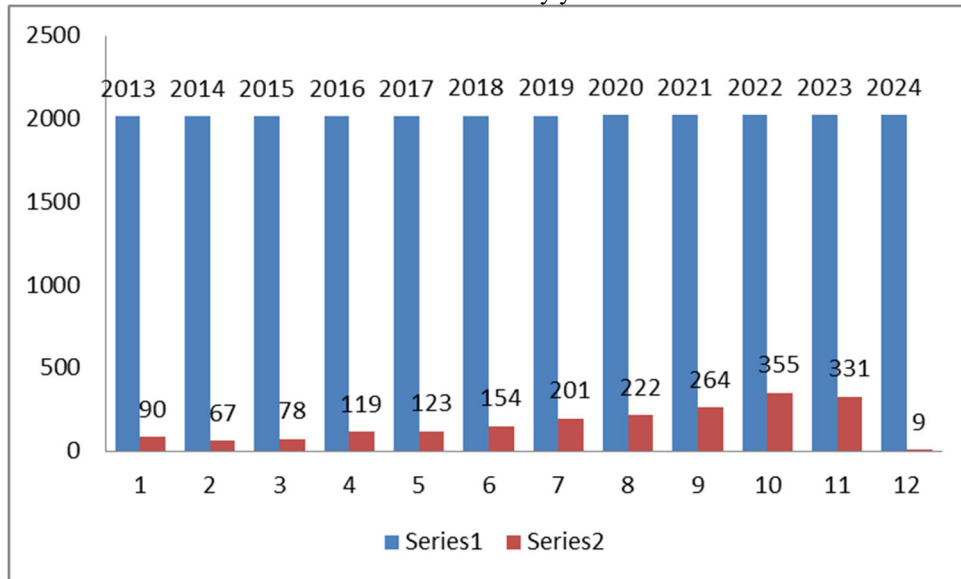
Most relevant authors

Table 4 shows the ten most influential authors in publications about Blended Learning. Graham, CR leads with the number of publications of 17 documents, followed by Zhu, C with 15 documents, Tsai, CW with 13 documents, Han, F with 9 documents, etc.
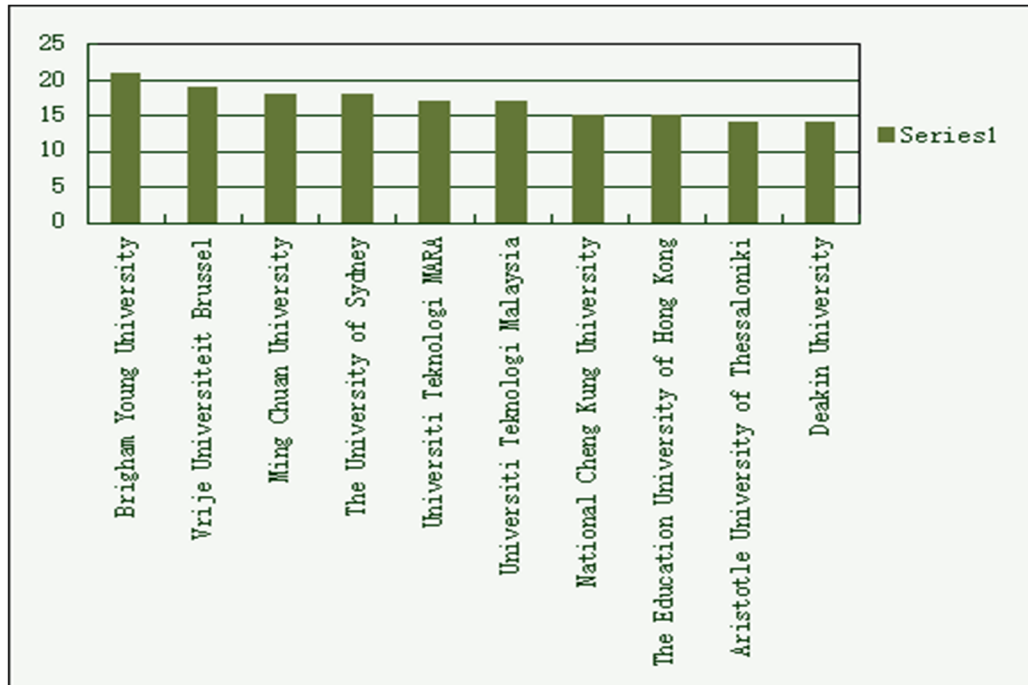
Table 4. Most Relevant Authors

Documents by affiliation

Figure 5 shows The 10 most influential affiliates in publications about Blended Learning, Brigham Young leads with 21 documents, to follow by Vrije Universiteit Brussels with 19 documents, Ming Chuan University with 18 documents , etc.

Table 5. Documents by Affiliation

Documents by country

Table 6 shows publications by country with the theme Blended Learning. The United States leads publications with a total of 386 documents. Followed by China with 280 documents.

The countries of the Asian continent dominate with 5 countries, while the countries of the American continent occupy the second dominant position, this shows that research with the theme Blended Learning is popularly carried out by countries on the Asian continent

Table 6. Documents by Country
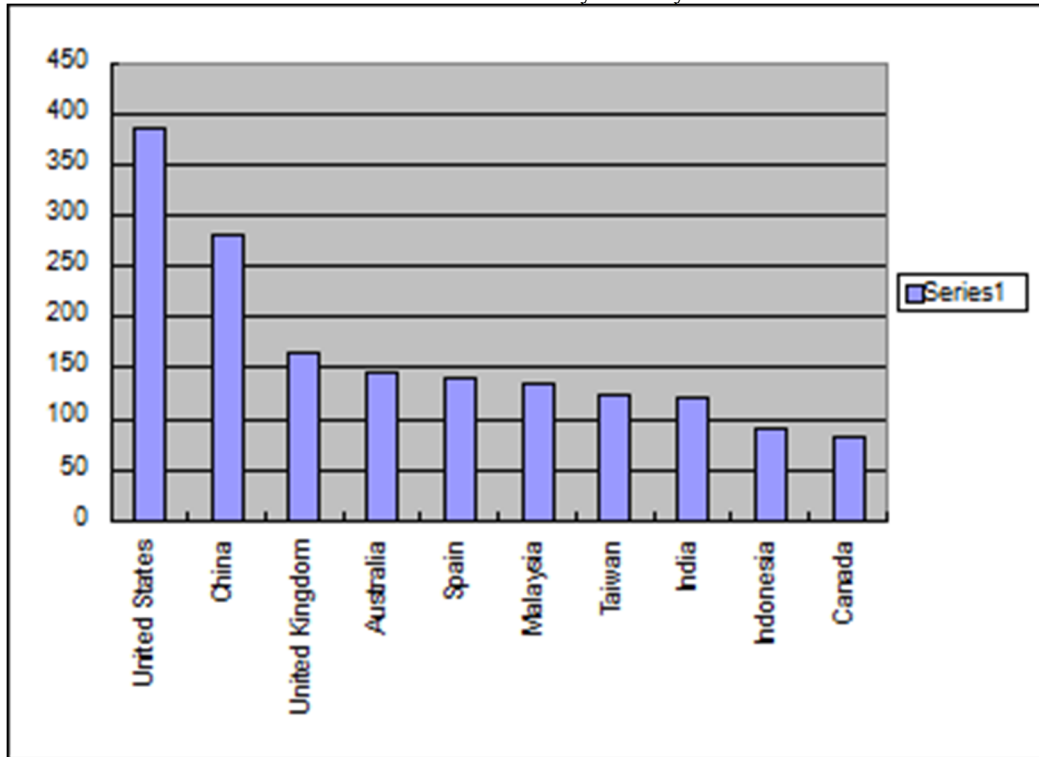

Three-Field Plot

Figure 7 contains 3 components that are watched; diary distribution title, creator title and theme/topic utilized. The three components are at that point associated by gray plot lines that relate to each other. Based on the title of the diary, each diary appears which creators most habitually contribute to its distributions, particularly those with the topic Blanded Learning.

The measure of the plot shows how numerous distributions relate to that subject. Based on the picture over, there are 8 diaries. The diary that distributes the foremost inquire about with the topic Blanded Learning is Blanded Learning in Instruction which is appeared in dim ruddy and is associated to a few creators such as Battalion DR Kanuka H, Bernard RM Borokhovski. E, and Bandura A.

Based on the picture in over, there are 32 The measure of the bar chart appears how numerous inquire about distributions each creator has distributed. Among the 10 authors who composed the foremost articles on the subject of Blanded Learning were Army DR Kanuka H, Bernard RM Borokhovski. E, and Bandura A.

In the third component, each investigate point is associated to an creator who has composed broadly on the subject of Mixed Learning. From the examination comes about, there are 8 watchwords Blanded Learning and E-Learning within the best position. This appears that the word is exceptionally closely related to investigate related to Mixed Learning.
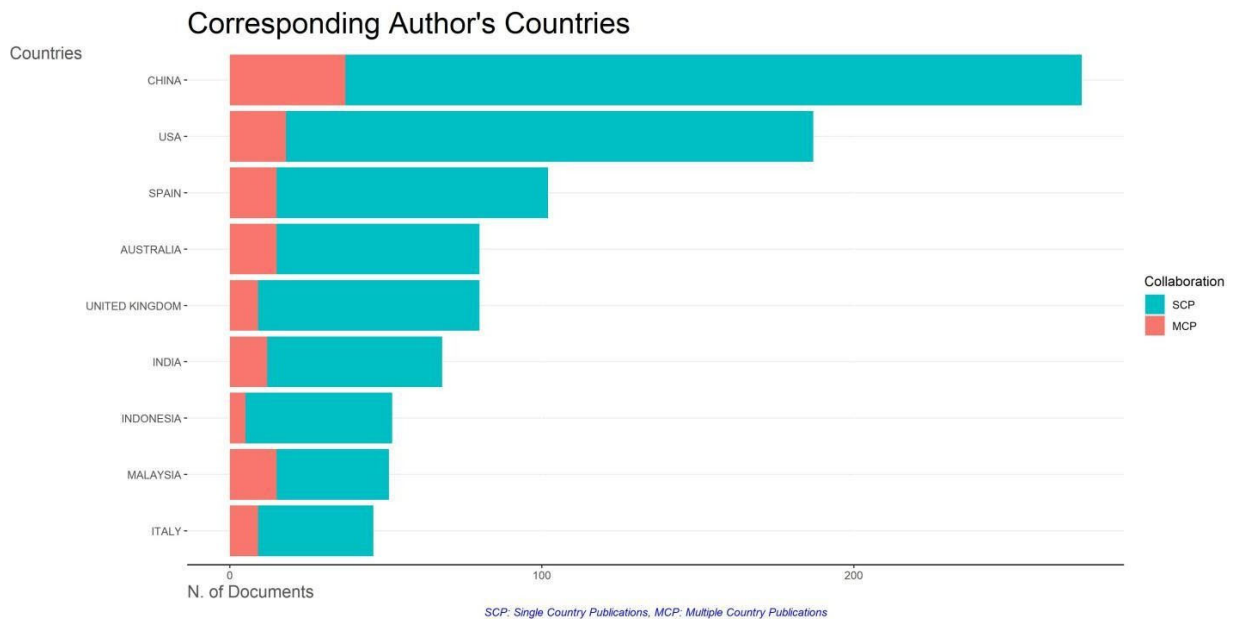
Table 7. Three-Field Plot
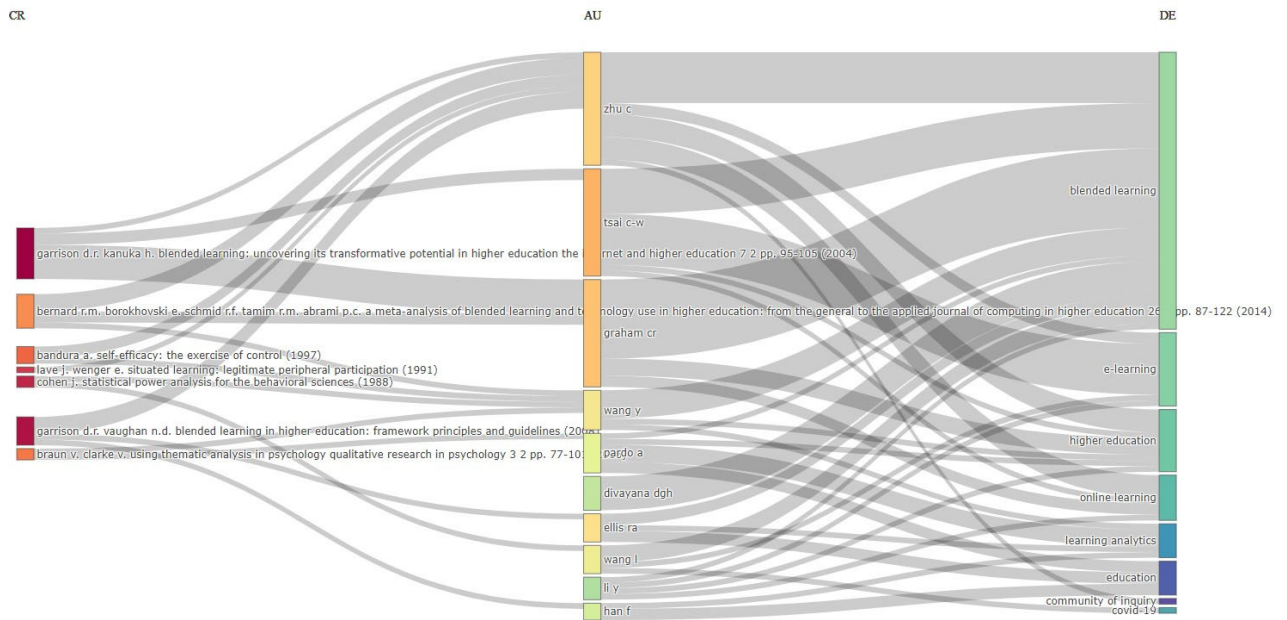
2. Corresponding Author's Countries

Based on picture under the largest country from the SCP side, namely China, and followed by USA and next Spain. If based on MCP, country largest published namely China, the dominating country Then followed by USA and Malaysia entered domination second.

Table 8. Corresponding Author's Countries

3. Most Global Cited Document

Based on picture under documents that have total citations biggest namely "Garrison Dr, 2004, Internet Higher Educ" with 2,318 citations However, the total TC per year is the largest namely "Rasheed Ra, 2020, Comput Educ" with 120.25 TC per Year.

Based on these data, it can be stated that TC (total citations) tends to influence TC per Year (citations per year). In general, papers that have larger TCs also tend to have significant TCs per Year. Although it is not always true that papers with large TCs necessarily have higher TCs per Year than others, and vice versa.

However, the year the paper was published tends not to have a significant effect on TC. Although there are some papers with older publication years that have lower TCs than papers with newer publication years, there are also exceptions where papers with older publication years can have high TCs. So, from the data provided, there is no consistent influence between the year of publication and the number of citations (TC).

Table 9. Documents by Country

Paper	Total Citations	TC per Year	Normalized TC
GARRISON DR, 2004, INTERNET HIGHER EDUC	2318	115,90	5,78
SO H-J, 2008, COMPUT EDUC	720	45,00	10,26
WU J-H, 2010, COMPUT EDUC	618	44,14	12,49
GIKANDI JW, 2011, COMPUT EDUC	605	46,54	13,96
KIM MK, 2014, INTERNET HIGHER EDUC	550	55,00	12,76
GARRISON DR, 2010, INTERNET HIGHER EDUC	544	38,86	10,99
LÓPEZ-PÉREZ MV, 2011, COMPUT EDUC	491	37,77	11,33

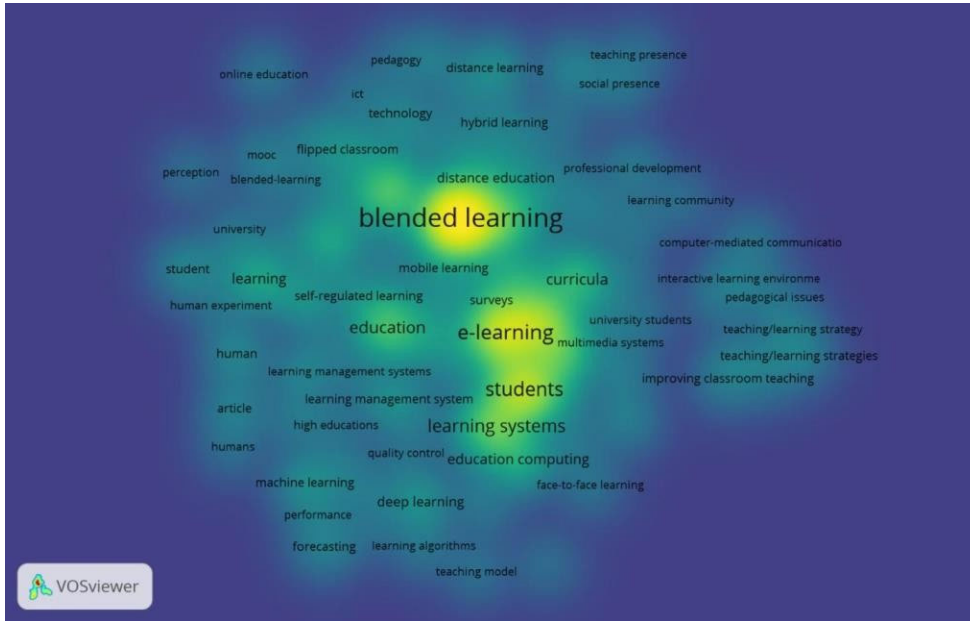|			
RASHEED RA, 2020, COMPUT EDUC	481	120,25	24,52
SHEA P, 2010, COMPUT EDUC	481	34,36	9,72
BAEPLER P, 2014, COMPUT EDUC	476	47,60	11,04

4. Most Local Cited Documents

Based on from picture Modt Local Ciled paper identified has the largest total local citations namely Garrison DR, with Internet Higher Education titles compared from 9 other papers with distance citation local lower. Based on analysis of Local Citations with Global Citations is sufficient influential from every paper. From the total Local Citations, each paper influences the total Global Citations.

Table 10. Documents by Country

Document	Local Citations	Global Citations	LC/GC Ratio (%)
GARRISON DR, 2004, INTERNET HIGHER EDUC	185	2318	7,98
MOSKAL P, 2013, INTERNET HIGHER EDUC	52	291	17,87
GRAHAM CR, 2013, INTERNET HIGHER EDUC	49	429	11,42
SHEA P, 2010, COMPUT EDUC	39	481	8,11
OWSTON R, 2013, INTERNET HIGHER EDUC	38	248	15,32
PORTER WW, 2014, COMPUT EDUC	37	320	11,56
BROADBENT J, 2017, INTERNET HIGHER EDUC	31	382	8,12
BOWER M, 2015, COMPUT EDUC	31	251	12,35
BARNARD L, 2009, INTERNET HIGHER EDUC	31	476	6,51
GINNS P, 2007, INTERNET HIGHER EDUC	31	284	10,92

Network Analysis (Network)

The picture above is an occurrence analysis from research on Blended Learning, with a minimum cluster size of 20. Each cluster has 3 items with minimum cluster size percentage 20, and more keywords dominate that is Where is Blended Learning? is the dominating keyword with a total link strength of 2,686.

The image above shows keyword network analysis based on overlay. It can be seen that the keywords higher education, online education, forecasting, academic performance, covid-19, motivation are keywords used in the latest year. Meanwhile, the keywords teaching learning strategies, improving classroom teaching, computer mediated communication, pedagogical issues, online systems, internet are keywords that have been used for a relatively long time since 2014.

Based on the image above, it can be analyzed that the keyword Blanded Learning has 1,016 occurrences, which is more dominant than all the keywords in cluster 1 and can be seen based on the brightest color, but for faint colors it means it has lower occurrences, for example the keyword pedagogy. has 19 occurrences in cluster 1. Likewise in clusters 2 and 3. The brighter color indicates more occurrences than the faint color. Like the example below:

keywords	occurrences	clusters
5. Blended Learning	1016	1
6. E-Learning	506	
7. Teaching Presence	19	
8. Pedagogy	19	
9. Student	459	2
10. Learning Systems	258	
11. Teaching Modes	19	
12. Information Management	19	
13. Education	199	3
14. Learning	102	
15. Case Study	24	
16. Mooc	28	

The table above shows the occurrence in each cluster which represents the main themes in the research field Blended Learning The theme in the first cluster is Blended Learning, the theme in the second cluster is Student, and theme in the third cluster is Education.

Conclusion

Publications with the theme Blended Learning peaked in 202 2 . The most relevant author is Graham CR with publications of 17 documents. The affiliate with the most publications is Brigham Young with a total of 21 publications. The country with the most publications is the United States with 278 documents. The largest MCP is Garrison Dr , 2004, Internet Higher Educ , the document with the largest citations, namely 2,318 citations. The basic theme in research on Blended Learning is blended learning, which is the dominant keyword with a link strength of 2,686. The keyword e-learning with a link strength of 2,210, the keyword students with a link strength of 2,500, and the keyword learning systems with a link strength of 1,331 are keywords used from 2016 to 2018. There are 3 mainstream themes, namely Blended Learning, Students, and Education.

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