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Exploring Trends in Active Learning Methods Research: A Comprehensive Scopus-Based Bibliometric Study

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Abstract

This study aims to determine the mapping of the development and direction of Active Learning Methods research in publications indexed by Scopus. This study used bibliometric analysis techniques to explore all journals indexed in Scopus' database of Active Learning Methods from 1985 to 2023. The data obtained were analysed using Excel and R/R-Studio. VOSviewer analyses the simultaneous occurrence of keywords and document citations visually. The author found 590 publications that fit the function, subject, and criteria set. The results of this study showed an annual growth rate of 10.96%, with the most publications on Active Learning Methods in 2022. The United States is the country that contributes the most publications, with an affiliation of the University of Florida. Rissanen became the most prolific writer on the theme of Active Learning Methods. The bibliometric analysis performed was limited to Scopus data. Other national and international databases should have been considered in the study. This study presents a brief overview of the literature accessible to researchers working in Education and provides recommendations for future research.
Keywords: Teaching, Students, Learning System, Active Learning, Method

Introduction

Education is a series of communication activities between people carried out in the form of teaching and learning processes. In teaching and Learning, students are expected to understand knowledge to develop ideas and solve problems (Djumali, 2013).

The rapid development of technology can affect the existing education system. With technology, Education can keep up with the pace of development in this increasingly modern era. Education is the main foundation for managing (Raharjo et al., 2021)producing and improving reliable and insightful human resources that are open and democratic. Therefore, renewal in Education (Daniel, 2016) is expected to be able to answer future challenges(Lindberg et al., 2016). The role of Education is crucial to creating an intelligent life (Nie, 2023) quality of national Education(Demirci, 2010).

Regarding the issue of Education in Indonesia, there are still many dark sides and education and teaching systems in our environment that require reformulation of concepts and a review of educational paradigms (van Ewijk et al., 2020)towards a more progressive vision. In this context, democratic Education, especially in the learning system in school institutions, must be examined seriously to face future challenges(Ladino Nocua et al., 2021). In educational democracy, accumulated principles can be applied in implementing Education in Indonesia, which is broader and more meaningful.

Active Learning (Genç, 2020) seems to have become the top choice in current educational practice. In Indonesia, this active learning movement and efforts to reform national Education were increasingly prominent around the end of the 90s. This movement of change continues now, and teachers are continuously encouraged to apply the concept of active Learning in every learning practice of their students(Yeoman & Wilson, 2019).

Bibliometric indicators are one of the tools that play a role in evaluating the results of scientific research; examining the interaction between science and technology, producing mapping of fields of science, and tracking/tracing the development of new knowledge in certain fields, (Kasmawati et al., 2022) and is an indicator of the future in making strategic plans(Jones et al., 2010).

This study aims to determine active learning methods in learning in publications indexed by the Scopus database from 1985-2023. The year 1985 was chosen as the starting year based on the findings in the Scopus database that that year was found one first publication.

Previous Research

Regarding the nature of the learning process, research by (Kasmawati et al., 2022) revealed that the learning process is a communication between two human elements, educators and students. In this communication, students as the subject matter are not learning objects that are limited and regulated by educators. As a subject of Learning, students must be active

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in Learning according to their talents and potential. In her research, (Kasmawati et al., 2022) also explained that using learning methods in each subject is very important because excellent and good learning methods will produce optimal Learning.

Regarding learning methods, research by (Nur Jannah, 2019) to facilitate a goal in the learning process. In her research, (Nur Jannah, 2019) also said that the learning method is all planning and steps in the teaching and learning process, including how the assessment is carried out. Learning methods have a crucial role in learning and increasing student motivation in following Learning (Cho et al., 2021) Many methods are used in the learning process, including the *Active Learning* method (Zaqiah et al., 2021).

Active Learning, according to (Nur Jannah, 2019)(Nur Jannah, 2019)skills (Ushatikova et al., 2019)attitudes (Leonard Jr. & Cook, 2010)(Bernstein et al., 1995), and value. Active Learning is carried out to facilitate teachers and please students throughout the learning process (Hasanah et al., 2023). Using various active learning methods in the learning process, it is hoped that Learning can optimize students' abilities and understanding (Metode et al., 2023).

From previous research on Active Learning Methods, bibliometric analysis research methods have yet to be used to map scientific publications in various fields.

Research Method

Bibliometric analysis methods were used in this study(M. Apriantoro et al., 2023; M. S. Apriantoro, 2023; M. S. Apriantoro et al., 2022; M. S. Apriantoro, Iskandar, et al., 2023; M. S. Apriantoro, Maheswari, et al., 2023; M. S. Apriantoro & Wijayanti, 2022). Data was obtained using the Boolean search engine to comb through the Scopus database between the years 1985 to 2023. The search will be conducted on July 22, 2023, at 11:15 a.m. Researchers used R and RStudio tools, VOSviewer, and Microsoft Excel to analyse citations, document content, and network. Researchers go through three stages in processing datasets.

In the first stage, researchers will conduct a literature review on related themes to ensure relevant research is carried out with bibliometric topics. In addition, a literature review helps determine appropriate keywords and represents the scope of research.

In the second stage, researchers used the boolean operator TITLE-ABS-KEY (method AND active AND Learning) to search Scopus, which resulted in 5,493 (non-filter) documents. Furthermore, filtration is carried out with boolean operators (LIMIT-TO (DOCTYPE, "ar") AND (LIMIT-TO (LANGUAGE, "English") AND (LIMIT-TO (SRCTYPE, "J") AND (LIMIT-TO (SUBJAREA, "SOCI"))) to limit articles only as document types, document sources only journals and documents in English, then the subject area of documents is only social science to produce 590 final documents.

In the third stage, analysis is carried out on the final document search using Scopus analyser and R and RStudio to find the number of documents per year, documents by journal, author, affiliation, country, and subject/field Furthermore, the document network level analysed with visualization through VOSviewer and Microsoft Excel data processing. This research procedure can be seen in Figure 1 below.

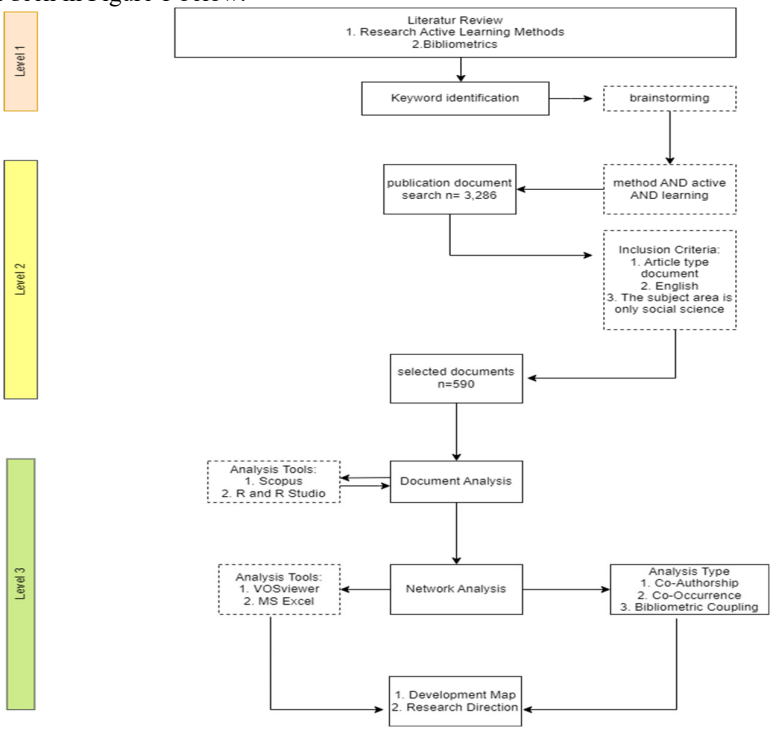

Figure 1. Research Flow Diagram

Result and Discussion

Document Analysis

Table 1 shows a summary of 590 Active Learning Methods-themed documents that have been collected over 38 years. From the following table, it can be seen that the number of authors from the range of 1985-2023 is 2059 authors, 89 single authors, the percentage of international authorship collaboration is 11.96%, and several references are used by authors as many as 22381 with an average document citation per year of 14.7.

Table 1. Active Learning Research Summary

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	1985:2023
Sources (Journals, Books, etc)	308
Documents	590
Annual Growth Rate %	10,96
Document Average Age	5,69
Average Citations Per Doc	14,07
References	22381
DOCUMENT CONTENTS	
Keywords Plus (ID)	1883
Author's Keywords (DE)	1812
AUTHORS	
Authors	2059
Authors Of Single-Authored Docs	89
AUTHORS COLLABORATION	
Single-Authored Docs	89
Co-Authors Per Doc	3,59
International Co-Authorships %	11,69
DOCUMENT TYPES	
Article	590

Documents by Year

Figure 2 shows the progress of publications with the theme Active Learning Methods from 1985 to 2023. Publications with this theme first appeared in 1985 with 1 document and stagnated from 1985 to 2008, but documents peaked again at the end of the 20th century, precisely in 2022, with as many as 85 papers. From the following picture, the development of research publications indexed by Scopus with the theme of Active Learning Methods has experienced ups and downs.

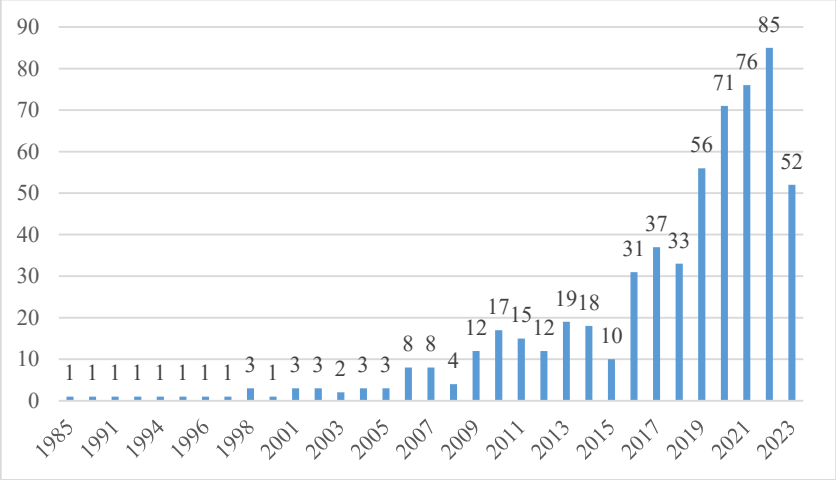

Figure 2. Development of Publication by Year

Most Relevant Authors

Figure 3 shows the ten most influential authors in publications on Active Learning Methods. Rissanen, A. leads with the number of publications of as many as three documents, followed by Babic-kekez, S and other authors with the same number of publication documents, as many as 2.

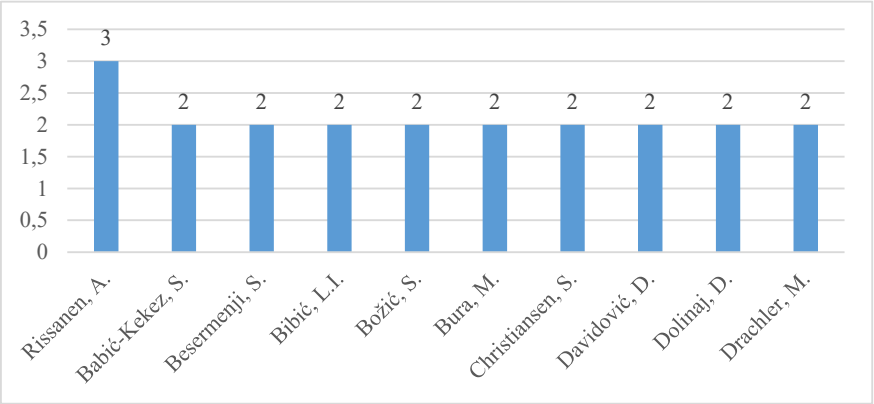

Figure 3. Most Relevant Authors

Documents by Affiliation

Figure 4 shows the ten most influential affiliates in publications on Active Learning Methods. The University of Florida leads with the number of affiliations with as much as 8 data, followed by the University of Michigan with the number of partnerships with as many as seven documents. Purdue University occupies the third place with the number of affiliated papers, as many as 6. The last order is occupied by the City University of New York and other Universities with the same number of affiliations, which is as many as five documents.

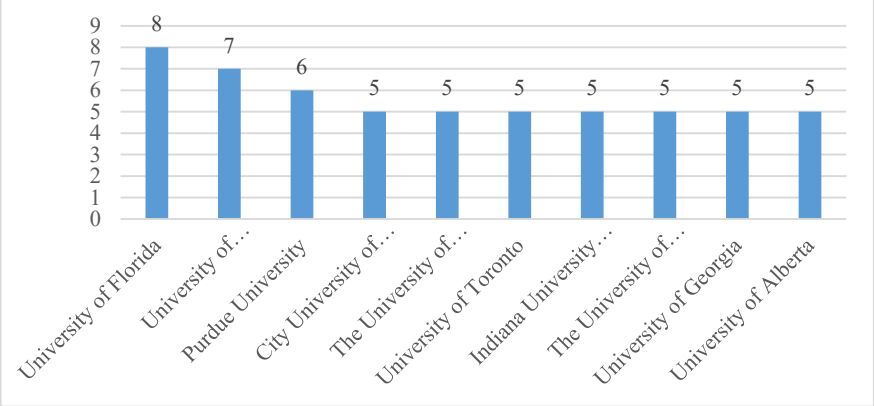

Figure 4. Most Influential Affiliates

Documents by Country

Figure 5 shows the number of publications by country with the research theme Active Learning Methods. The most muscular dominance comes from the Americas, Europe, Asia, and Australia. This dominance can be proven by the number of countries in the Americas that actively contribute more publications than countries from other continents. The American continent includes the United States, the United Kingdom, and Canada. The European continent became the second continent that also dominated publications, coming from 2 countries, namely Spain and Germany. They were then followed by the Asian continent consisting of governments, Indonesia, Russia, China, and Turkey, and then followed by the country of Australia from the Australian continent. Thus, it is known that research-themed Active Learning Methods are quite popular in the Americas.

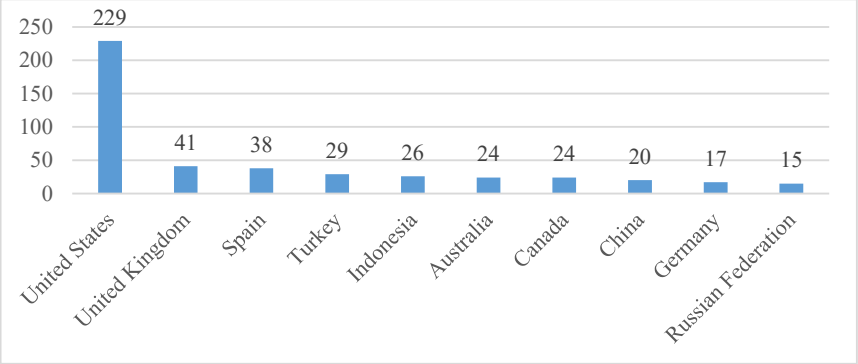

Figure 5. The Number of Publications by Country

Documents by Source

Figure 6 shows ten journals that actively contribute to the publication of documents with the theme Active Learning Methods indexed by Scopus and led by BMC Medical Education which has a total of 24 publications, followed by Sustainability Switzerland with 16 documents, Medical Teacher with 12 papers and followed by other jurnals who have almost the same number of publications, in the range of 8-11 documents.

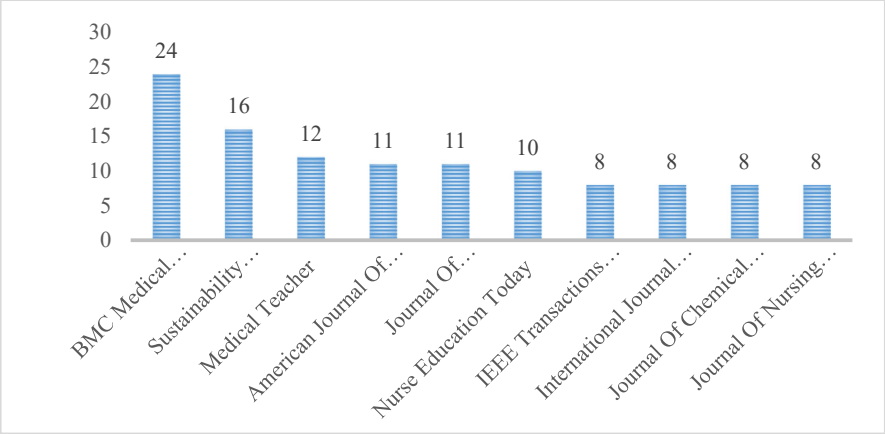

Figure 6. Most Active Journal

Three-Field Plot

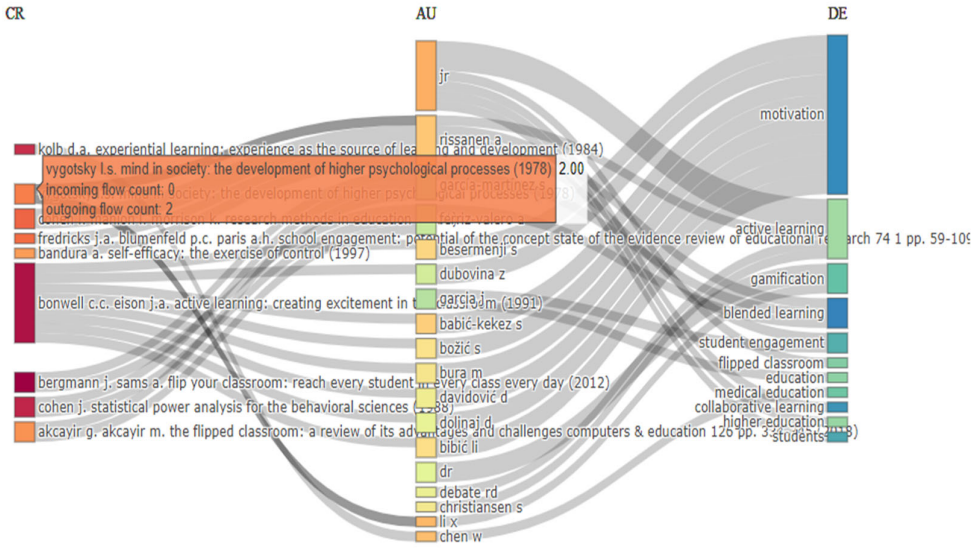

Figure 7. Three-Field Plot

Figure 7 contains three elements observed by the author, including references, author names, and keywords. The three elements are then connected by gray plot lines that are linked to each other. CR elements are reference articles authors (AU elements) use to generate keywords (DE elements) in publications that use Active Learning Methods.

Active Learning: Creating Excitement in Classroom (1991) became the most widely used reference by the author to publish documents themed Active Learning Methods in the classroom, which had as many as eight outflows. This flow is the most compared to others. This was followed by the article Flip Your Classroom: Reach Every Student, Every Class, Every Day (2012) with an outflow of 3. She was then followed by several articles with the same outflow, a range of 2-3 currents.

Based on the picture above, it can also be identified the authors who most popularly publish their research. From the size of the bar chart, it can be seen that among the 17 authors who contributed the most are Rissanen. A, JR, Babic Kekez, Bura.M, DR, and Bibic Li.

The DE element is a keyword that is the result of the author's research topic connected to a reference article regarding the topic of Active Learning Methods. From the results of the analysis conducted by researchers, there are 11 main keywords. Motivation, Active Learning, and Gamification are at the very top, with more than four inflows. This shows that the word is closely related to research related to Active Learning Methods.

Corresponding Author's Countries

From the picture below, researchers try to show the countries that most often publish authorship both individually and in collaboration between countries. The United States is the country that has the most publication documents, both the results of Multiple Country Publication (MCP) and Single Country Publication (SCP), followed by China, the UK, Canada, Turkey, and Indonesia. From the picture below, we also know the continent that nominated the research, namely Asia.

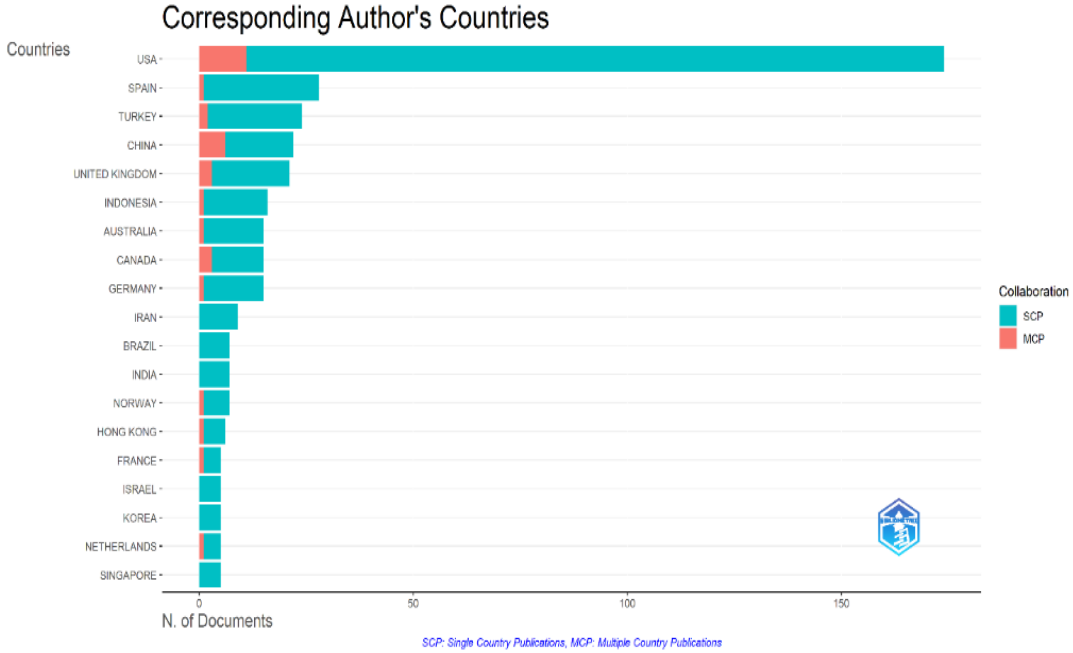

Figure 8. Corresponding Author's Countries

Most Global Cited Document

The paper with the most extensive total citation is Roach T, 2014, Intrev Econ Educ, then the form that has the largest Tc per Year is Keyser MW, 2000, Res Strateg. From the table above, it can be identified that the year of publication affects TC.

Table 2. Most Global Citied Document

Paper	Total Citations	TC per Year
Roach T, 2014, Int Rev Econ Educ	276	27,60
Huang J, 2014, Tob Control	204	20,40
Shellman Sm, 2006, J Polit Sci Educ	196	10,89
Galway Lp, 2014, Bmc Med Educ	182	18,20
Fatmi M, 2013, Med Teach	160	14,55
Menekse M, 2013, J Eng Educ	153	13,91
Clark Mc, 2008, J Nurs Educ	150	9,38
Bond M, 2020, Comput Educ	131	32,75
Keyser Mw, 2000, Res Strateg	126	5,25
Martí-Parreño J, 2016, J Comput Assisted Learn	122	15,25

Network Analysis

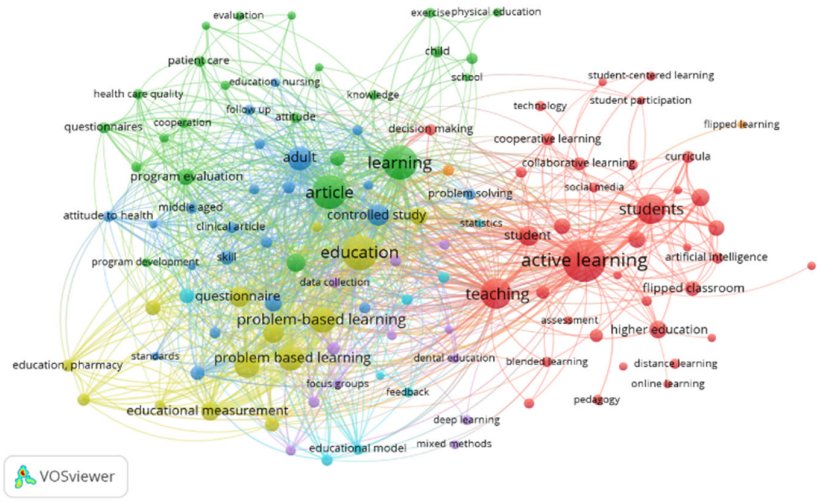

Figure 9. Occurrence Analysis

The above is an occurrence analysis from research on Active Learning Methods using VOSviewer devices with a minimum cluster size of 15. From these results, 4 clusters were found, namely red, yellow, green, and blue clusters. Then, the number of red clusters is 39 items, yellow clusters are 46 items, green clusters are 24 items, and blue clusters are 20. Then, the keyword that dominates is Active Learning.

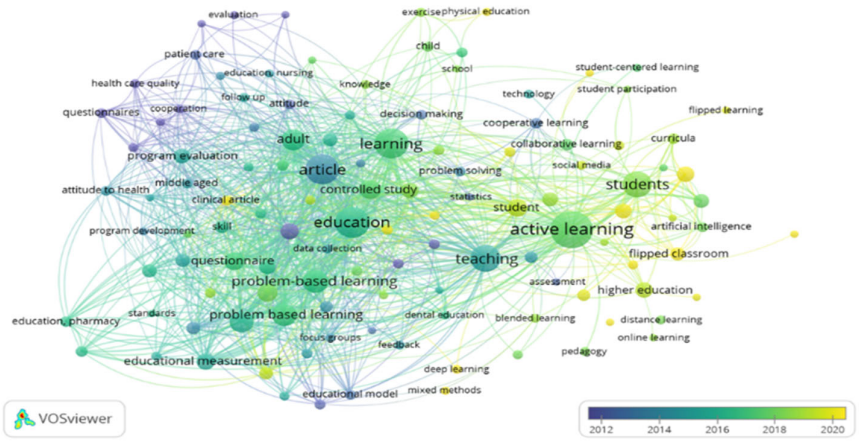

Figure 10. Keyword Network Analysis

The image above shows a keyword network analysis based on Overlay. The keyword learning system, e-learning, is a keyword that is being used in the current year, from 2018 to 2023. Teaching, problem-based Learning, and education are keywords with a relatively long usage around 2016.

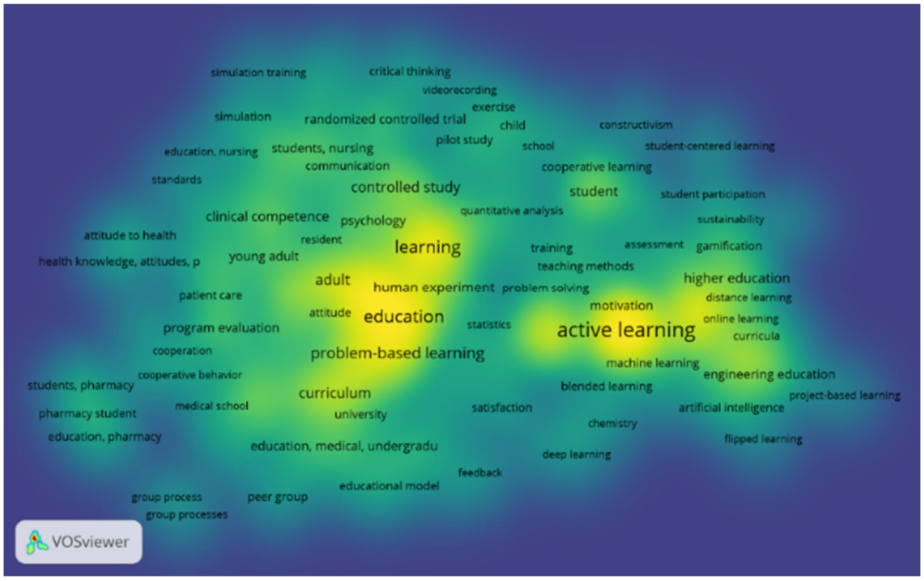

Figure 11. Research Density

The picture above is an analysis of research density. Keywords with high density are those with light colors, such as active Learning, education, and Learning. Keywords with a dark lacquer or less clear color mean that they have yet to be studied much, such as blended Learning or problem-based Learning.

Table 3. The Occurrence in Each Cluster

Keyword	Occurrences	Cluster
1. Active Learning	143	1
2. Teaching	75	
3. Students	70	
4. Higher Education	25	
5. E-learning	22	
6. Cooperative Learning	12	
7. Blended Learning	9	
8. Assessment	6	
9. Student participation	6	
1. Education	98	2
2. Problem-based Learning	52	
3. Adult	46	
4. Curriculum	46	
5. Controlled study	37	
6. Procedures	33	
7. Skill	16	
8. Critical thinking	11	
9. Simulation	10	
10. Communication	9	
1. Learning	94	3
2. Methodology	27	
3. Program evaluation	22	
4. Program development	22	
5. Evaluation	7	
1. Organizational and management	18	4
2. Information Processing	14	
3. Educational model	11	
4. Models, educational	10	

The table above shows the occurrence in each cluster that represents the main theme in the research Bida ng Education. The theme in the first cluster is the type of Learning used by teachers in the learning process. The theme in the second cluster is education devices. The theme in the third cluster is management and learning models.

Conclusion

Based on the research above, it is known that there is a positive growth in research on Active Learning Methods of 10.96% with the peak of publication occurring in 2022. Rissanen, A., is the most relevant author with 3 published documents. The University of Florida is the most influential affiliate with the publication of 8 documents. The United States leads the number of publications with 229 documents, followed by the UK. Based on the analysis of the country, it is known that research with the theme of Active Learning is popularly carried out by countries in the Americas. BMC is the most relevant source in publications with the theme of Active Learning Methods as many as 24 documents. Bonwell C.C. Eison J.A is the most influential author with the production of 8 main keywords from the analysis of Three Fields Plot. The most total citations of 276 are from Roach T, 2014, Int Rev Econ Educ, and the global average citation per year is 27.60. In network analysis with VOSviewer, several keywords dominate, including "Active Learning" with a total of 143 network links. The keyword Learning, System e-learning which is widely used in 2022. These keywords can indicate the novelty of research in the field of Education. Based on Cartographic Analysis, it is known that there are 3 main themes, yes, in the first cluster it has a theme of teaching that teachers use in the learning process. Then, the theme in the second cluster is educational devices, and the third cluster has the theme of management and learning models.

This study has limitations only performing analysis on the Scopus database without taking into account other databases and only taking into account English documents. Future research is expected to explore other databases, such as WOS, and consider more complex analyses.

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