

English Teaching: Bibliometric Analysis of Artificial Intelligence and English Teaching

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ABSTRACT

The phenomenon of Artificial Intelligence nowadays has spread over the world, especially in education. The involvement of Artificial Intelligence in English teaching is essential to study because it shows the trend of how English is taught with the development of AI. The aim of this study is to uncover the trend of Artificial Intelligence and English teaching from 2013 to 2022. This study applied quantitative descriptive method. To find the trend of Artificial Intelligence and English teaching, the data were gathered from Publish or Perish application (PoP) and then visualized by using Vosviewer. To process the data, bibliometric analysis was applied. The data of the study indicates there were 791 publications concerning artificial intelligence and English teaching from 2013 to 2022. Furthermore, the data from 2013 to 2022 related to Artificial Intelligence and English teaching indicates that the number of studies concerning these keywords were gradually increasing from year to year where the year “2021” became the year where the highest number of studies related to Artificial Intelligence were published. Bibliometric analysis in this study showed that the publications concerning Artificial Intelligence and English teaching from 2013 to 2022 were increasing year by year. This finding implies that people now are familiar with applications of technology such as AI in English teaching. Thus, this study can give visualization to other researchers about AI and English teaching. The researcher can explore more detail about the use of Artificial Intelligence in teaching, especially in English teaching.

Keywords: Bibliometric Analysis; Artificial Intelligence; English Teaching

INTRODUCTION

Studies or research about English teaching have been developed since a long time ago. There are various types of studies about English teaching. Among them are the use of mapping in reading, the use of presentation to increase speaking and some other studies which related to English teaching. As time goes by, English teaching undergoes development, especially related to the application of technology in teaching English.

Nowadays, technology occupies a crucial position in English teaching. The advancement of technology has affected the way how English is taught. There are some tools or applications that can be implemented in English teaching which can ease the work of English teachers, namely content creation and grading in English teaching (Jiang et al., 2024; Peltzer et al., 2024). These technologies can be applied by teachers to create materials and quizzes for students. By using these tools, the teachers can save time. Furthermore, the application of advanced tools in English teaching may build innovation in the way English language is taught in class.

Pertaining to that, the implementation of Artificial Intelligence or Ai is well known nowadays. (Ilham et al., 2024) stated that a subfield of computer science called Artificial Intelligence (AI) studies how computers can be trained to do things that normally need human intelligence, like understanding human language, making decisions, and learning from experience. Besides that, Intelligence (AI) is defined “as the ability of machines or computer programs to imitate or perform tasks that usually require human intelligence, such as decision-making, speech or image recognition, and problem-solving” (Pettersen, 2019; Zhang & Lu, 2021) in (Triansyah et al., 2023).

LITERATURE REVIEW

Ilham et al in 2024 conducted a study about artificial intelligence in education. The result of the study indicates that there was a significant increase from 2014 to 2022 in artificial intelligence and education studies. Besides that, another study conducted by (Lubis et al., 2024) shows the implementation of Artificial Intelligence and language learning experience a gradual increase in 2028 to 2023. Lubis also used bibliometric analysis in doing the study. Another study conducted by (Garcia Castro et al., 2024) also shows that the publication about artificial intelligence in education increased from 1978 to 2023. From the previous studies, most of them indicate the increase of publication about artificial intelligence in education. However, the previous study focused on a wider area, namely education. On the other hand, in the present study, the focus issue of bibliometric analysis is more specific, namely Artificial Intelligence and English teaching. Thus, the gap of this study with previous studies related to the focus aspect about Artificial Intelligence with its focus research. The focus Sof this study is the analysis of Artificial Intelligence and English teaching. This present study digs into more

specific field that is artificial intelligence and English teaching which are different with the previous studies.

Artificial intelligence is an example of advanced technology that is employed for various purposes. Artificial intelligence can ease the human task in many fields such as in banking, statistics as well as in education. Attributed to education, Ai can be employed to assist education especially in English teaching and learning. In teaching English, AI has affected the way teachers teach. Teachers admitted that they reconstruct their pedagogical approach especially concerning the use of AI where the students can get different learning experiences (Hartono et al., 2023). Besides that, the result of a study that was conducted by Rukiati et al in 2023 showed that AI technologies have beneficial impact on students' learning process. Based on that study, AI can be implemented in writing (the use of grammarly, or ChatGPT), in speaking (the use of Duolingo, HelloTalk etc) and in reading (Readlang application). Similarly, a study conducted by Obari et al in 2020 on the use of AI in English teaching on Japanese students shows that there was a positive result on the use of AI in the TOEIC test. In this study, AI speakers using Google home mini were used as a tool in teaching English.

Recently, AI technologies are frequently used by many teachers or lecturers in the teaching and learning process. (Rukiati et al., 2023) stated that currently, AI is being utilized more and more in ELT to improve the accessibility, effectiveness, and engagement of language learning. However, the use of this application in the English learning process in some cases could not replace human ability (Rukiati et al., 2023).

In regard to this phenomenon, this study focuses on analyzing the application of AI in English teaching through bibliometric analysis. The focus of this study was to investigate the number of studies that have been done in the previous ten years, namely from 2013 to 2022 about the application of Artificial Intelligence in English teaching. In doing this study, bibliometric analysis was applied. Bibliometric analysis was used to uncover the trend of study related to artificial intelligence and English teaching in the previous ten years. Bibliometric is generally defined as the analysis of publications such as books or articles which apply statistical methods. Pritchard in (Glänzel, 2003) defined bibliometrics as “the application of mathematical and statistical methods to books and other media of communication.”

Broadus and Pritchard in (Donthu et al., 2021) explained that bibliometric analysis involves the use of quantitative approach in analyzing the data which includes citation analysis on data such as publication and citation that belongs to bibliometric data. Similarly, Ho in (Iriyani et al., 2023) stated that bibliometric is a method of data collection that functions to explore and analyze big data. Thus, it can assist researchers to gain the data needed.

Furthermore, this study also aimed at describing data analysis stages from bibliometric related to study of Artificial Intelligence and English teaching using Publish or Perish (PoP) and Vosviewer systematically. “Vosviewer is a free toll for making maps to visualize bibliometric network data”(Wong, 2018). On the other hand, Publish or Perish is “software program that retrieves and analyzes academic citation (Admoko et al., 2024).” These applications or software were used to process the data.

METHOD

This study applied quantitative descriptive method. The data collected in this study were the data that have been gathered from the application named PoP (Publish or Perish). The data were the articles related to keywords that are indexed by Google Scholar. The data gathered were processed quantitatively by using bibliometric. This study used bibliometric analysis in processing the data. Bibliometric is a method of data collection that functions to explore and analyze big data. Ho in (Iriyani et al., 2023) states that “bibliometric is a method of research that has quite complete information which combines science, math and statistics in analyzing knowledge quantitatively.” After the data were collected, the data then visualized by using Vosviewer for mapping the data. The data that were analyzed were data from 2013 to 2022 concerning artificial intelligence and English teaching. After all the data have been processed and visualized, the data then are described to readers.

RESULT AND DISCUSSION

From the data collected, there were 791 publications concerning artificial intelligence and English teaching from the Scholar database. These data were obtained from 2013 to 2022. The table below shows the distribution of the publication from each year related to artificial intelligence and English teaching.

Table 1. Number of Publication

No	Tahun	Jumlah Artikel/Tahun
1	2013	12
2	2014	8
3	2015	39
4	2016	26
5	2017	39

6	2018	81
7	2019	105
8	2020	139
9	2021	193
10	2022	149

Table 1 shows numbers of articles regarding artificial intelligence and English teaching for ten years starting from 2013 to 2022. In the early years, namely in 2013 to 2017, there were few numbers of articles about Artificial Intelligence and English teaching and the increase of the articles about Artificial Intelligence and English teaching between these years were not too significant. In 2018 to 2021, the number of articles concerning this topic were consistently and significantly increased but, by 2022 the number of articles about this topic underwent insignificant decrease. Based on the data that gathered from Public and Perish from 2013 to 2022, it was found that there were 791 articles attributed to Artificial intelligence and English Teaching. The table below also shows the articles about artificial intelligence and English teaching that were mostly cited over the previous ten years , from 2013 to 2022.

Table 2. Number of Citation

No	Citation	Year	Titles	Source
	906	2020	Motivasi belajar mahasiswa pada pembelajaran daring selama pandemik covid-19 (Fitriyani et al., 2020)	Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran e-journal.undikma.ac.id
	842	2019	Systematic review of research on artificial intelligence applications in higher education—where are the educators? (Zawacki-Richter et al., 2019)	International Journal of Educational Technology in Higher Education https://educationaltechnologyjournal.springeropen.com

	260	2022	Employing Adaptive Learning and Intelligent Tutoring Robots for Virtual Classrooms and Smart Campuses: Reforming Education in the Age of Artificial Intelligence (Lubis et al., 2024)	Advanced Computing and Intelligent Technologies https://link.springer.com
	199	2021	A review on artificial intelligence in special education (Huang et al., 2021)	Management Research: 4th World Summit on the Knowledge Society https://link.springer.com/
	178	2022	Computers and Education: Artificial Literacy in Higher and adult Education Intelligence (Su et al., 2023)	Computers and Education: Artificial Intelligence https://www.sciencedirect.com/
	174	2020	Bahan Ajar Sebagai Bagian Dalam Kajian Problematika Pembelajaran Bahasa Indonesia (Aisyah et al., 2020)	Jurnal Salaka: Jurnal Bahasa, Sastra, dan Budaya Indonesia journal.unpak.ac.id
	112	2020	Learning, Media and Technology (Learning, Media and Technology, https://www.tandfonline.com/journals/cjem20)	Taylor & Francis
	109	2021	Design of online intelligent English teaching platform based on artificial intelligence techniques (Sun et al., 2020)	https://onlinelibrary.wiley.com/journal/14678
	97	2015	Pengaruh dividen per share (DPS), dividen payout ratio	JIAFE (Jurnal Ilmiah Akuntansi Fakultas Ekonomi)

			(DPR), price to book value (PBV), debt to equity ratio (DER), net profit margin (NPM) and return on asset (ROA ... (Asmirantho & Yuliawati, 2015)	
	71	2019	Implementasi Program Pendidikan Karakter Di Sekolah Dasar Negeri Lawanggintung 01 Kota Bogor (Pertwi et al., 2019)	Jurnal Pendidikan dan Pengajaran : Guru Sekolah Dasar journal.unpak.ac.id

The table 2 above shows that topic about “Motivasi Belajar Mahasiswa dalam Pembelajaran Daring selama Pandemic Covid” becomes the most frequent topic to be cited in 2020.

Table 3. Number of Clusters

Cluster	Cluster network
cluster 1 (87)	ability, application, artificial, artificial intelligence,artificial intelegent, artificial intelligence, artificial intelligence technique, assessment, attitude, behavior change, big data, big data cloud computing, case study, challenge, child, classroom, competence, comprehension, computer science information technology, concept, covid, e learning, educator, effect, effectiveness, effort, elementary school, english, english language, english teacher, english teaching, era, experience, faculty, foreign language, function, game, image video processing, implementasi, implementation, indonesia, information technology, interaction, internet, kecerdasan buatan, learning, learning process, lecturer, logika fuzzy adalah cabang dari sistem kecerdasan buatan, mastery, medium, menggerakkan robot, model, motivation, neuroscience, online learning, optimization, outcome, pandemic, perception, platform, potential, problem, process, relationship, research, researcher, review, role, school, science, sistem, skill, society, songs, strategy, student, study, teacher, teaching english, teaching material, technique, teknologi, telecommunication system technology, training, use, utilization.
cluster 2 (11)	change, impact, influence, learning independence, main character, novel, performance, personality, relation, self efficacy, small.
cluster 3 (9)	article, education, english language teaching, formulation, issue, linguistics

	study, management policy, penggunaan model problem, teaching.
cluster 4 (8)	analysis method, blended learning, development, diversity, factor, high school student, learning media, understanding.
cluster 5 (4)	book value, equity, equity ratio, roe.
cluster 6 (4)	creative thinking skill, investigation, project, quality.
cluster 7 (3)	analysis, discovery, social interaction.
cluster 8 (3)	accountability, community, empowerment
cluster 9 (2)	penerapan, smp negeri.
cluster 10 (1)	penerapan
cluster 11 (1)	organizational citizenship behavior
cluster 12 (1)	Pengembangan
cluster 13 (1)	Pengembangan
cluster 14 (1)	Dongeng
cluster 15 (1)	sekolah dasar
cluster 16 (1)	local wisdom
cluster 17 (1)	studi kasus
cluster 18 (1)	Analisis

The table number 3 above shows the result of cluster analysis about artificial intelligence and English teaching . From the quest, , it is found that there are 18 clusters about topics related to artificial intelligence.

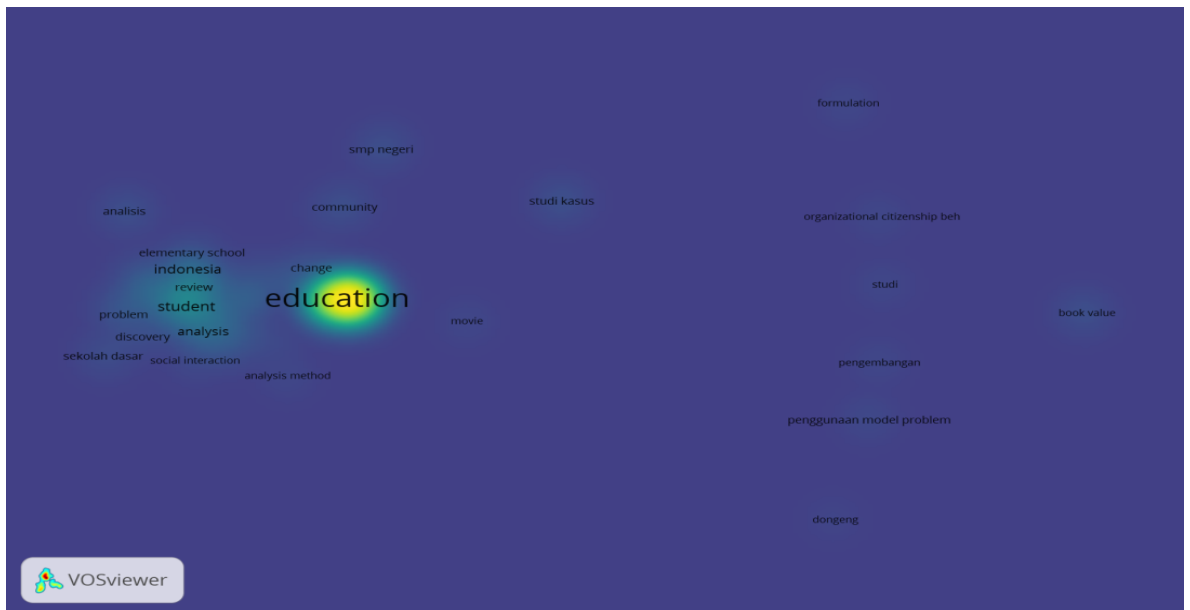
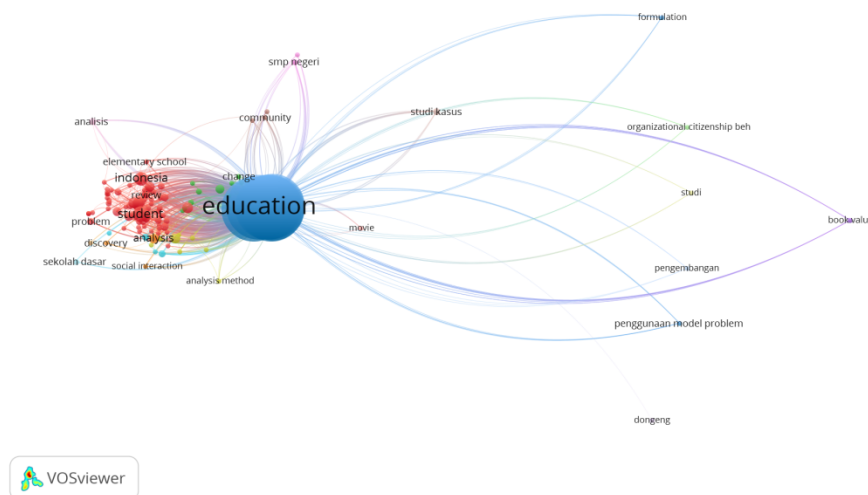


Figure 1. Vosviewer

Figure 1 shows three different colors. Those are yellow, green and blue. Yellow color implies the number of studies regarding the key words (artificial intelligence and English teaching). The brighter the yellow color indicated that the keywords were denser. It implies that there were many studies concerning artificial intelligence and English teaching that have been done. On the other hand, the more the yellow color fades such as turns from green to blue, it indicates there are still few studies that have been done in that field.



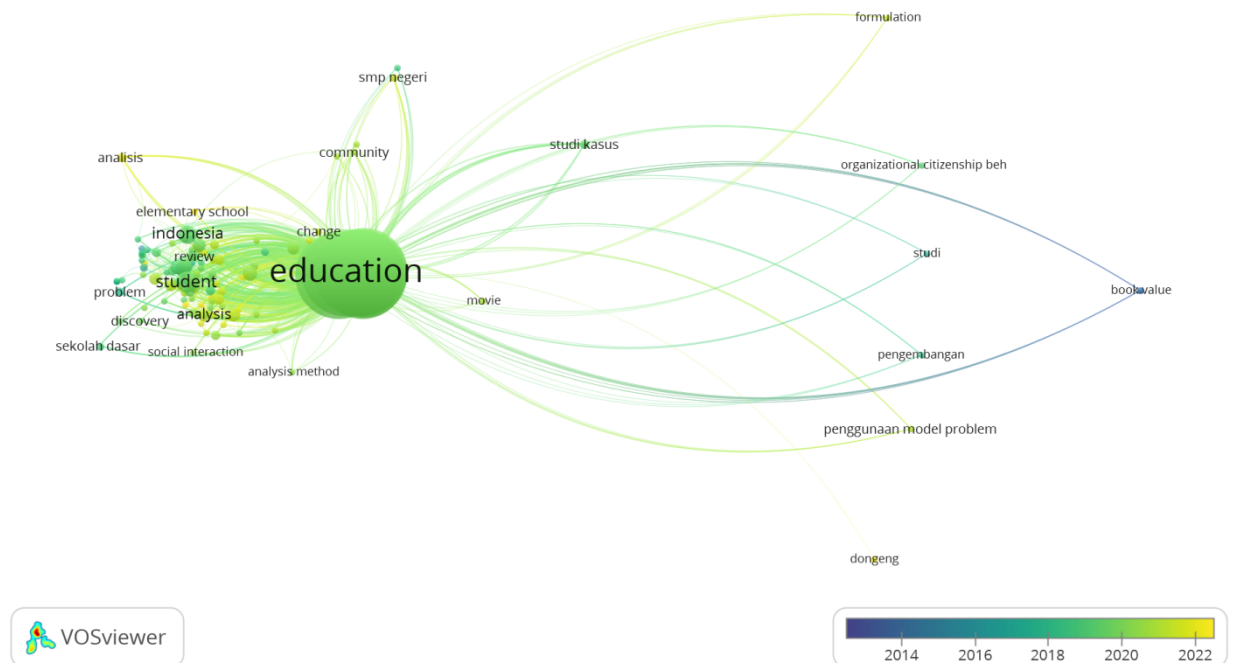


Figure 2. Network Visualization

The figure number 2 shows the network visualization from the keywords Artificial Intelligence and English teaching.

The data from this study indicates that the publications that were indexed by google scholar from 2013 to 2022 about Artificial Intelligence and English were increasing. The result from the analysis indicated that there were 791 publications that related to the key words “Artificial Intelligence and English teaching”. This data is aligned with the data from previous studies concerning Artificial Intelligence and education. Both of them were increasing. However, the results of the present study give more information to specific field namely, Artificial Intelligence and English teaching. The result of the study indicates that people now actively involve the use of technology such as Artificial intelligence in the English language teaching.

However, the results of the present study give more information to specific fields namely, Artificial Intelligence and English teaching. If the previous studies focus on wider areas like AI and education, the present study specifically focuses on AI and English teaching. Furthermore, the result of the present study which shows the increase of studies or publication about Artificial Intelligence and English teaching from 2013 to 2022 indirectly indicates that people now actively involve the use of technology such as Artificial intelligence in the English language teaching process.

This finding may give information through visualization about the development of studies about Artificial Intelligence and English teaching.

CONCLUSION

This study focuses on analyzing the trend of Artificial Intelligence and English teaching from 2013 to 2023. This study used bibliometric analysis in processing the data. The result from the analysis indicated that there were 791 publications that related to the key words “Artificial Intelligence and English teaching”. From the Vosviewer result, it indicates that from 791 publications, there were two items that relatively have been studied the most. Those were Artificial Intelligence with education and elementary school and it also includes Artificial Intelligence and English teaching. Thus, from this study, the trends of publications related to Artificial Intelligence and English teaching have been found where the number of studies concerning these keywords have increased in recent years namely in 2013 to 2022. The result of this study was aligned with previous studies where the combination of keywords namely, Artificial Intelligence and English teaching showed the increase of publications from year to year (2013 to 2022). For further research, the result of this study can be used by other researchers to find out more advanced implementations related to Artificial Intelligence and English teaching. This research is also expected to be the resource or reference for other researchers in determining his or her further study concerning Artificial Intelligence and English teaching or other fields that have been explored.

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