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Mapping Research Trends of TikTok in Education: A Bibliometric Analysis

Abstract: The popularity of TikTok as a social media platform beloved by the general public enables reaching a broader audience through its engaging interface. The global proliferation of TikTok has transformed it from merely an entertainment platform into a potential educational tool. This study aims to identify research trends related to the use of TikTok in the field of education using bibliometric analysis. Data was obtained from 46 publications obtained from the Scopus database in 2020–2023, which were filtered based on TikTok keywords in the context of education. Data analysis was carried out with the biblioshiny package of the RStudio application. The results showed that publications increased sharply in 2022. Geographically, China and the United States contributed the most. The main keywords included “social networking”, “TikTok”, and “students” representing the research trends on utilising TikTok for learning. The most cited articles indicate TikTok’s potential as an innovative pedagogical tool to increase learners’ engagement and motivation and expand public access to education and health information. Further research was recommended to enrich multidisciplinary perspectives and maximise the benefits of TikTok for learning.

Keywords: bibliometric analysis, education, TikTok.

Introduction

Education continues to grow globally, especially since the end of the Second World War (Dunlop, 2023; Zafrullah et al., 2023; Zafrullah & Zetriuslita, 2021). The transformation in education was significantly driven by technological developments. Technological advances open up new opportunities in the delivery of subject matter, enabling the utilisation of innovative and interactive learning tools (Secundo et al., 2021). Technology-enabled education has been not only a trend but also a very promising opportunity to improve learning effectiveness and accessibility (Ali, 2020; Burbules et al., 2020; Criollo-C et al., 2021; Haleem et al., 2022). The use of technology in education has given students easier access to information, facilitated more interactive and creative learning, and equipped them with skills relevant to the modern era (Dakhi et al., 2020; Musyafak & Subhi, 2023). The integration of technology in education, particularly through interactive multimedia and mobile platforms, has demonstrated significant effectiveness in fostering engaging learning environments and enhancing student motivation (Gayatri et al., 2024; Pratama et al., 2024). Additionally, the accessibility and instant feedback capabilities offered by educational technology allow students to pursue self-paced learning, resulting in improved comprehension of challenging subjects such as programming

(Gayatri et al., 2024). The combination of education and technology not only created advancements in learning methods but also opened the door to vast opportunities for the development of student's potential in the future.

Students could undergo the learning process well because of the teacher's efforts to create a conducive situation, including by providing the right learning media. According to Wibawanto, quoted in the learning media book, learning or educational media could be interpreted as humans and objects or events that make student conditions possible to acquire knowledge, skills, or attitudes (Nurfadhillah, 2021). The availability of learning media allows students to think more concretely, so learning media is needed to support success in the teaching and learning process (Rejeki et al., 2020). The use of learning media provided many positive benefits that were enormous in facilitating the student's learning process. Learning media has been a vital component of learning that acts as a bridge to convey subject matter. The existence of learning media was crucial as one of the supporting factors for the success of teaching and learning at school. This was due to the function of learning media, which can increase the effectiveness of delivering information and knowledge to students. In addition, the use of learning media also plays a role in increasing student interest in learning (Nurfadhillah, 2021). Therefore, learning media has been a fundamental component that teachers must pay attention to to support the success of learning and improve the quality of education.

The rapid development in the field of technology, multimedia, and social media today has opened opportunities for instructors to utilise it optimally as a learning medium. The development of social media was no longer limited to connecting to exchange news between one individual and another but could also play a role as a medium for learning, such as an application that was behind the public spotlight known as TikTok.

TikTok is a social media platform that enables users to create short-form videos ranging from 15 to 60 seconds, enhanced by various creative features including music, filters, stickers, and other interactive elements (Lahooti et al., 2023). There were supporting features in the TikTok application that could make content more attractive and easier to market. This application was first launched by a company from China, ByteDance (Bahri et al., 2022). The majority of TikTok app users in Indonesia were millennials, and school-age children, commonly known as Generation Z (Abutalip et al., 2023). The popularity of TikTok allows many people to easily market their content. The popularity of TikTok allows many users, especially young people, to use this platform to obtain various information and knowledge that was packaged densely and clearly through TikTok content (Bahri et al., 2022). The use of the TikTok application has the potential to be used as an innovative learning medium in today's digital era.

The growth of TikTok over the past few years reflects a positive trend involving various fields, not only limited to increasing popularity among users but also bringing positive impacts in sectors such as education. The widespread use of TikTok has encouraged educational researchers to conduct research related to it. Many researchers discuss topics related to user experience and interest in technology, the use of TikTok applications in various fields, changes in one's motivation through TikTok, and the potential use of TikTok applications in various fields (Wang, 2020; Omar & Dequan, 2020; Su et al., 2020). Realising the amount of research and interest that educational researchers put into this topic, it was necessary to conduct a bibliometric analysis to map research trends on this topic.

The bibliometric analysis could be done with the biblioshiny package in the Rstudio application. Rstudio was superior to other data analysis tools because it was an open-source application, had rich statistical computing features, mature algorithms, and attractive visualisations. R was a statistical and graphical computing program (Team, 2022). Currently, R has been widely recognised as one of the most powerful programs in data mining. Bibliometric research with RStudio and the biblioshiny package has been conducted by previous studies (de Oliveira Dias & de Miranda Rocha, 2023, 2024; de Paulo et al., 2023; Desul et al., 2023; Dias et al., 2023; Thakuria et al., 2023). However, research that analyses TikTok research trends in the context of education using bibliometric analysis using RStudio, especially the biblioshiny package, has rarely been done before. Therefore, this research would fill this gap by conducting bibliometric analyses on research on TikTok in the context of education. This research would focus on bibliometric analysis related to TikTok in the context of education. By conducting this research, it was hoped that the trends, developments, and impacts of TikTok used in education would be identified, opening up space for a deeper understanding of the role of this platform in supporting the learning process and modern education. This research aims to conduct a bibliometric analysis examining TikTok's educational applications. The study addresses several key research questions, including publication profiles, annual publication trends, journal frequency analysis,

country-wise productivity metrics, author analysis and collaboration networks, institutional productivity, emerging keyword trends, and content analysis of highly cited documents. Through investigating these aspects, this research seeks to identify trends, developments, and the impact of TikTok in supporting contemporary learning and educational practices.

Research Methods

This study implements a bibliometric analysis method to map contemporary research trends on the topic of TikTok in the realm of educational studies. Bibliometric analysis was chosen as an appropriate method because it was a quantitative and systematic approach to analysing publication and citation data to map and monitor the development of a field of science (Oluwadele et al., 2023). The data used in this study was secondary data obtained from the Scopus database. The Scopus database was chosen as the main data source because it has a more comprehensive collection of indexed documents than other databases (Mongeon & Paul-Hus, 2016).

We applied several filters to filter the documents to be analysed. The filters were applied with the main consideration of fulfilling the research objectives. We made sure the filters used were in line with the research objectives. The first filter used the keywords “TikTok” OR “tiktok” OR “tiktok” in the article title search. This filter was chosen because this research aims to map trends in educational research on the topic of TikTok. Thus, we included all possible spellings of the word TikTok in the article title search. The second filter utilises the source title feature, where they must contain keywords such as “education” OR “educational” OR “teach” OR “teaching” OR “teacher” OR “pedagogy” OR “pedagogies.” We made this restriction because we wanted the analysed articles to focus on the field of education. For scientific fields, we limited it to the social sciences. These two filterings were done because Scopus does not have a specific filter to select the subject area of education, so we chose the subject area of social sciences. The subject area of education was assumed to be covered by the subject area of social sciences. By applying these three filters, we obtained 46 documents ready for bibliometric analysis. The data was analysed using R software with the biblioshiny package (Aria & Cuccurullo, 2017). The data analysis was conducted using R software with the biblioshiny package. The dataset, exported from Scopus in CSV format, was analyzed using R’s biblioshiny package, which facilitates comprehensive data visualization and in-depth exploration of publication metrics through its extensive features. The analysis encompasses publication distribution by year, country, and journal, as well as author collaboration network mapping. This methodological approach enables the research to provide a comprehensive overview of research dynamics and academic contributions in this emerging field.

Research Results

Publication Profile. This study explored scientific publications related to the topic of TikTok on the subject of education in the Scopus database for the period 2020–2023. The literature search yielded 46 relevant publications. The distribution of publication types is presented in Table 1.

Table 1. Distribution of Publication Types related to TikTok in Education (2020-2023)

Publication Type	Number of Document	Percentage
Journal Articles	30	65%
Conference Papers	9	20%
Book Chapters	5	11%
Research Note	1	2%
Other Types of Publications	1	2%
Total	46	100%

Publication Results by Year. Figure 1 presents publication distribution data by year of publication during the literature review period from 2020 to 2023.

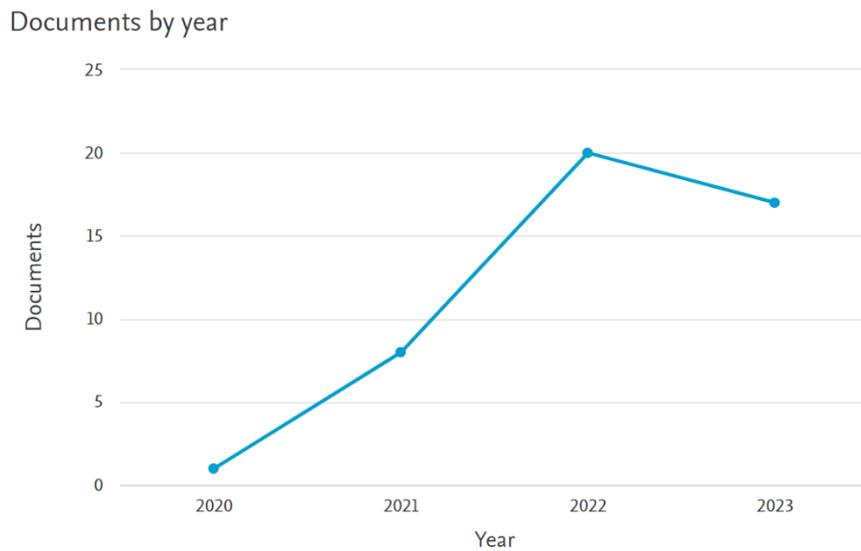


Fig.1. Publication Frequency Every Year (2020-2023)

Journal Frequency Analysis. Research publications related to the topic of TikTok in education were spread across 41 sources during the period 2020 to 2023. Table 2 presented the five sources with the most document contributions.

Table 2. The Publication Frequency by Source (2020-2023)

Journal	Number of Document	Percentage
Education and Information Technologies	3	6.52 %
Routledge Handbook of Media Education Futures Post-Pandemic	2	4.34 %
Journal of Hospitality Leisure Sport and Tourism Education	2	4.34 %
International Journal of Learning Teaching and Educational Research	2	4.34 %
Teaching Sociology	1	2.17 %

Most Productive Countries. Figure 2 presents the ten countries with the highest number of publications on the topic of TikTok used in education over the period 2020–2023.

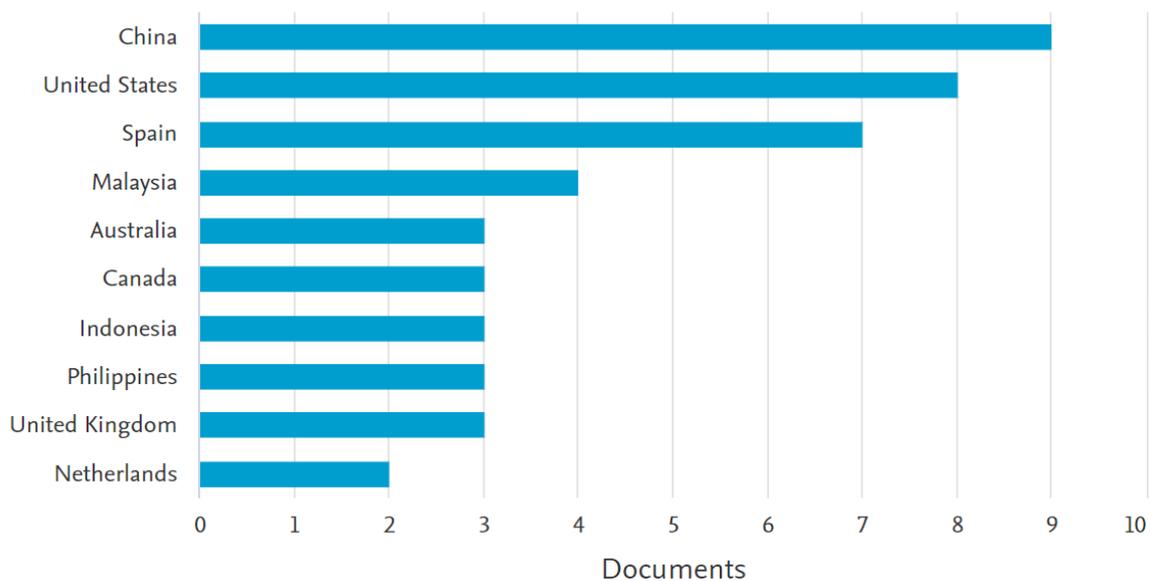


Fig. 2. Publication Output by Country (2003–2021)

Author/Co-Author. Table 3 shows the ten authors or colleagues who have published the most.

Table 3: Publication Frequency by Author (2020-2023)

Author	Number of Document	Percentage
Vizcaíno-Verdú, A.	2	4.35 %
Abd Halim, N.D.	1	2.17 %
Abidin, C.	1	2.17 %
Abzhekenova, B.	1	2.17 %
Adriaansen, R.J.	1	2.17 %
Aini, N.	1	2.17 %
Alguacil, M	1	2.17 %
Anindhita, H.	1	2.17 %
Arcega, K.C.A.	1	2.17 %
Arias, D.	1	2.17 %
Vizcaíno-Verdú, A.	1	2.17 %

A total of 112 authors contributed to 46 publications related to the topic of TikTok in education during the period 2020–2023, either as the main author or co-author. Most authors were involved in only one publication. Table 3 highlights the ten authors with the highest number of publications as lead or co-authors. Vizcaíno-Verdú, A. ranked the highest with 2 publications, or about 4.35% of the total publications. Followed by Abd Halim, N.D., Abidin, C., Abzhekenova, B., Adriaansen, R.J., Aini, N., Alguacil, M., Anindhita, H., Arcega, K.C.A., Arias, D., and Vizcaíno-Verdú, A. with 1 publication each (2.17%).

Figure 3 presents a visualisation of the collaboration network between authors on publications related to the topic of TikTok in education. 16 clusters of collaboration between authors were formed.



Fig.3. Collaboration Network between Authors

Most Productive Institutions. Figure 4 presents the 10 most productive institutions in publishing publications related to the topic of TikTok in education during the period 2020–2023.

Research Discussion

Publication Profile. The research topic was more widely studied and published in the form of journal articles than other types of publications. Publication in scientific journals indicates that this topic has been researched in depth and meets the standards for publication in reputable international journals that use a rigorous peer-review process. Meanwhile, publications in the form of conference papers indicate that this topic was also the focus of discussion and the exchange of ideas in scientific forums. The existence of publications in the form of book chapters was also important to disseminate research findings to academic and practitioner audiences through reference books. With this diversity of publication forms, research related to this topic appears to have grown rapidly in the last four years. This topic was also projected to continue to grow in the future. TikTok has a great opportunity for educational research because it fits the characteristics of Generation Z as the main users. Its creative and engaging short video features could increase students' interest in learning. TikTok also facilitates visual and auditory learning styles and could make learning more fun (Syah et al., 2020).

Publication Results by Year. The average number of journal articles published per year is 11.5 documents. There was a significant increase in publications from year to year. In 2020, only one journal article was published. This number increased to 8 in 2021 and peaked in 2022 with 20 journal articles. In 2023, 17 journal articles were found. This pattern of increasing publications indicated that the research topic has received greater attention and interest from researchers in the last 4 years. The year 2022 became the year with the highest research productivity, with a total of 20 documents, or 43.48% of all publications found. The factor that caused this increase in publications could be the pandemic in 2020, so that the use of social media platforms, including TikTok, became increasingly widespread. The rise of this phenomenon has led to a surge in research interest in this topic. By recognising this factor, we hope to support efforts to improve the quality and quantity of research in the future.

Journal Frequency Analysis. The Education and Information Technologies journal ranked first with a total of 3 published articles or 6.52% of all publications on this topic. The high contribution of Education and Information Technologies indicated that this journal has a focus that was relevant to the topic of study, namely information technology in education. Therefore, many researchers were interested in publishing research results related to the used of TikTok as a new technology in education in this journal. The dominance of Education and Information Technologies also showed that the topic of TikTok in education was in line with the scope and interests of the journal's readers. Researchers who want to published similar research results in the future could maked Education and Information Technologies a prospective journal for submitting manuscripts.

Most Productive Countries. China ranked first with a total of nine published documents, or 19.6% of the total publications. This was followed by the United States with 8 documents (17.4%), Spain with 7 documents (15.2%), Malaysia with 4 documents (8.7%), and Australia, Canada, Indonesia, and the Philippines with 3 documents each (6.5%). Furthermore, the Netherlands contributed 2 documents (4.3%). This pattern of geographical distribution of publications showed that TikTok-related research in education has attracted global interest, especially in China as the country of origin of TikTok. China's dominance could be explained by the country's widespread access to and use of TikTok, so many researchers were interested in studying its implementation in education. Significant contributions from the United States and other countries were also reasonable, given TikTok's growing popularity globally.

Author/Co-Author. The author's publication frequency distribution pattern indicated that research on TikTok topics in education was dominated by many researchers with low productivity levels. Only a few researchers have consistently focused on this topic in recent years. The publication productivity of Vizcaino-Verdú, A. is commendable, demonstrating their commitment to pioneering research in this area. In the future, collaboration between researchers needed to be improved so that the contribution of each author was more evenly distributed and sustainable, so that research on this topic could develop more comprehensively.

Figure 3 shows that VizcainoVerduu have important role in initiating and developing research collaboration on this topic. Meanwhile, most authors were in separate and relatively small clusters. This fragmented pattern of collaboration indicates that there was limited networking and research synergy between researchers on TikTok and education. Broad collaborations were needed for research on this topic to develop more comprehensively and impactfully. For example, interdisciplinary collaboration between technology, education, and behavioral experts. Going forward, key researchers like VizcainoVerduu could

play a strategic role in bridging and expanding collaborations with more researchers from diverse disciplines. This would enrich research perspectives and methodologies and lead to more significant contributions.

Most Productive Institutions. Universiti Kebangsaan Malaysia (UKM) ranked first with a total of 2 publications, or 4.34% of the overall data. UKM was followed by 9 other institutions with the number of publications between 1 document. The dominance of UKM showed the role of this institution as the main contributor to research on TikTok topics and education compared to other institutions. The high number of publications from SMEs was commendable, reflecting the institution's concern for this relevant and cutting-edge research topic. SMEs' productivity could be explained by their research focus on technology and educational innovation, which was in line with the trend of TikTok usage. In the future, other research institutions and universities need to increase attention to this topic so that research could develop more evenly and comprehensively from various scientific perspectives.

Word Trend. The most dominant keyword was "social networking (online)," which represents discussions about social networking and online social media in general. Followed by the keywords "tiktok" and "students," which specifically discuss the main topics, namely TikTok and students. Furthermore, there were also relevant keywords such as "big data," "image communication systems," "informal learning," "learning systems," "social media," "social media platforms," and "surveys." This overall keyword pattern illustrates that the focus of the publications lies on the utilisation of TikTok as a popular social media platform among students for informal learning purposes. These results confirmed the alignment of publication topics with frequently used keywords. For further research, content and textual analyses of the articles could be conducted to understand the context and perspectives used in the discussion of these keywords.

The keyword "social networking (online)" showed a steady and significant increase, becoming the most frequent keyword consistently every year. The word "tiktok" also experienced a similar upward trend until 2022, but decreased in 2023. Meanwhile, the word "students" continued to increase until 2022 and reached a saturation point in 2023. The keywords "surveys" and "image communication systems" were quite stable without significant fluctuations during the analysis period. The word "big data" had a sharp increase in 2021 and 2022 and then decreased in 2023, with a similar pattern but a lower scale than "tiktok." The words "social media" and "social media platforms" showed a moderate and consistent increase from year to year. Overall, these keyword trends showed a progression of research focus from social networks and social media in general towards a specific discussion of TikTok and its application in learning, reaching a saturation point in 2023. These results provided useful information on topics and approaches that have started and stopped trending over the past four years.

Content analysis of the most cited documents. We would present a content analysis of the three most-cited documents in the Scopus database. Hayes et al. (2020) explored the use of TikTok as a pedagogical tool with 65 sports science students in Spain. The results of the mixed study showed TikTok could increase student motivation and engagement as well as develop creativity and curiosity. Therefore, TikTok was recommended for body expression courses in sport science undergraduate programs. Comp et al. (2021) found that during the COVID-19 pandemic, TikTok has been effectively utilised by medical professionals to disseminate information and conduct training with short videos. This study recommended healthcare and medical education institutions consider using TikTok to reach a wider audience. Escamilla-Fajardo et al. (2021) reported that an educational TikTok video on chemistry created by students had 8,500 views. Surveys showed the video increased viewers' interest in and understanding of chemistry. Thus, TikTok has the potential to be a tool to increase student and public engagement with science education. Taken together, these three studies showed that TikTok was an innovative multimedia platform for educational purposes and the dissemination of health and science information to students and the general public.

Conclusion

Scientific publications on the topic of TikTok in education have shown a rapid increase in the last 4 years (2020–2023). This indicates that this research topic has been increasingly receiving widespread attention from academics. 2022 was the year with the highest publication productivity (43.48%), likely triggered by the surge in Tik-Tok usage during the COVID-19 pandemic. Geographically, China and the United States contributed the most. Education and Information Technologies was the main journal that published articles related to this topic. Geographically, China and the United States ranked highest in terms of the number of publications, in line with TikTok's popularity in those two countries. In terms of institutions, Universiti Kebangsaan Malaysia contributed the most. The dominant keywords in the publications include

"social networking," "TikTok," "students," "social media," and "learning systems," which generally represent a focus on the use of TikTok for informal learning among students. Content analysis of the most cited articles indicated that TikTok has the potential to be an innovative pedagogical tool to increase learner engagement and motivation and expand public access to education and health information. Overall, these findings confirm that research on the application of TikTok in education continues to grow rapidly and shows great potential to be utilised in future learning practices. Further research was needed to enrich multidisciplinary perspectives and maximise the impact of implementing TikTok as an effective and innovative pedagogical tool.

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