

Tren Terkini dalam Penelitian Podcast Pendidikan: Analisis Bibliometrik dengan Tinjauan dari Bidang Pertanian

Emerging Trends in Educational Podcast Research: A Bibliometric Analysis with Insights from Agricultural Domains

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ABSTRAK

Podcast telah menjadi media pembelajaran yang populer saat ini karena sifatnya yang fleksibel, portabel, dan mendukung pembelajaran mandiri. Penelitian ini bertujuan untuk mengkaji perkembangan publikasi terkait podcast dalam pendidikan. Studi bibliometrik diterapkan terhadap 3660 dokumen dalam rentang 2005-2025. Alat analisis menggunakan VOSviewer dengan metode *fractional counting* untuk menjaga proporsionalitas bobot data. Temuan menunjukkan minat akademis yang semakin meningkat terhadap podcast dalam pendidikan, dengan kontribusi dominan dari ilmu sosial dan relevansi yang muncul di bidang pertanian. Podcast menunjukkan kegunaan luas untuk pendidikan yang dapat diskalakan dan inklusif, terutama dalam konteks pertanian dengan sumber daya terbatas. Meskipun muncul kelompok penulis aktif, kolaborasi lintas negara dan disiplin masih terbatas.

Kata kunci:

analisis bibliometrik, pertanian, podcast, tren penelitian, vosviewer

ABSTRACT

Podcasting has become a popular educational media due to its flexible, portable nature and support for self-directed learning. This study investigates the development of publications related to podcasts in education. We conducted a bibliometric study on 3,660 documents published between 2005 and 2025. Documents were analysed using VOSviewer, employing the fractional counting method to maintain data weight proportionality. The findings indicated a growing scholarly interest in podcasts in education, with dominant contributions from social sciences and emerging relevance in agricultural domains. Podcasts demonstrated broad utility for scalable, inclusive education, especially in low-resource agricultural contexts. Although there are active author clusters, cross-institutional and interdisciplinary collaborations remain limited.

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1. INTRODUCTION

A podcast is a way to distribute audio or video content in a digital format, derived from the combination of the words "iPod" and "broadcast." This media allows users to download or subscribe to content accessed through computers or portable devices, so it can be listened to flexibly anytime and anywhere (Jham et al., 2008; McGarr, 2009). Additionally, podcasts are utilized by students to support a more personal and independent learning style (Jham et al., 2008). Furthermore, podcasts can serve as a medium for implementing the latest evidence-based practices for practitioners and students (Kelly et al., 2022). However, the use of podcasts in education is not intended as the primary medium but rather as a substitute, complementary, and creative tool for students (McGarr, 2009). Pedagogically, podcasts are transmissive, meaning they only transfer information without two-way interaction (Drew, 2017). The distinctive features that differentiate podcasts from radio broadcasts are the audience with specific interests, the content having a long shelf life because it can be downloaded and replayed whenever needed, and the relatively easy production and publication process because it does not require special equipment (Rime et al., 2022; Tsagkias et al., 2010). Moreover, it could be part of blended learning and outreach initiatives (Lohrer et al., 2010; Pietruska et al., 2021). Therefore, podcasts are very suitable for teachers, students, or anyone who wants to share ideas or knowledge independently.

Recently, academic interest in educational podcasts has increased significantly. This is evident from the increasing popularity of the "education" category on various podcast aggregator platforms (Drew, 2017). In Indonesia, the trend of podcast consumption shows a significant increase, with the average person spending 1.04 hours per day listening to podcasts in the third quarter of 2024 (We Are Social et al., 2025). Indonesia even ranks second globally in terms of podcast user share, with 52% of users, just below Brazil (Statista, 2025). Amidst the dominance of entertainment genres such as comedy, which ranks first, the education genre is beginning to show a promising position, ranking fifth with a respondent share of 35% (JakPat, 2024c). Interest in podcasts as a learning medium is also reflected in the data that 18% of millennials and 24% of Generation Z listen to podcasts for educational purposes (JakPat, 2024b, 2024a). Meanwhile, online media consumption in Indonesia has generally been high for several years, with 58% of active internet users accessing various digital media in 2020 (We Are Social et al., 2021). This condition shows that productive age groups, such as students and educators, are starting to make podcasts a part of the 21st-century digital learning ecosystem.

As the role of podcasts in education increases, various studies have been conducted to explore their effectiveness, implementation, and acceptance in the context of teaching and learning. For example, the research by Jham et al. (2008) in the field of dentistry utilized podcasts to disseminate recordings of technical procedures, discussions on specific topics, or even lecture syntheses. Furthermore, Tobin & Guadagno (2022) researched the influence of a person's personality and their habit of listening to podcasts. The results indicate that people who are open to new experiences, have a high level of curiosity, and enjoy deep thinking listen to podcasts more frequently. Conversely, individuals who prioritize social acceptance show little interest in podcasts. Moreover, Tobin & Guadagno (2022) found that the duration of someone's podcast listening is not directly related to psychological well-being, such as a sense of independence, feeling competent, or feeling connected to others. Instead, there is an emergence of parasocial relationships that are related to social imagination between

listeners and podcasters. Additionally, social engagement has a positive correlation with beneficial feelings and psychological experiences.

Furthermore, the focus of current research is on studies that use bibliometric analysis, which allows researchers to analyze publication trends, frequently used keywords, author collaborations, and thematic maps based on bibliographic data. [Chen et al. \(2020\)](#) conducted a bibliometric study on educational technology, among several other bibliometric studies related to podcasts. [Levin et al. \(2023\)](#) analyzed the altmetric attention score (AAS) to estimate the impact of academic publications and citation scores on the use of podcasts related to gynaecological cancer. [Lin et al. \(2023\)](#) analyzed the quality index of educational blogs and podcasts in the field of health and critical care. [Chen et al. \(2024\)](#) conducted text mining and bibliometric analysis on technology-enhanced learning used in higher education. [Zhao & Zhou \(2024\)](#) conducted a bibliometric analysis related to digital trends in higher education. Lastly, [O'Connor et al. \(2025\)](#) conducted a bibliometric analysis related to the use of social media in nursing and midwifery education. Based on previous bibliometric studies, most of their research did not specifically analyze podcasts but rather focused on educational technology, with podcasts being one of the technologies used.

On the other hand, the bibliometric study conducted by [del Pino-Espejo et al. \(2022\)](#), which used data from the Web of Science (WoS), identified 439 articles that explicitly researched podcasts in education during the period 2005–2020. They utilized the SciMAT analysis tool to examine the most influential topics and authors. Although the study provided important contributions, the approach used still has several limitations, such as narrow data coverage, and recent post-pandemic trends are less explored. Despite growing interest in educational podcasts, previous bibliometric analyses have not specifically examined their role or development within agricultural domains. The absence of discipline represents a gap that this study seeks to address.

To address these gaps, this study conducts a bibliometric analysis of 3,660 publications related to podcasts in education indexed in Scopus from 2005 to 2025. Using Vosviewer, it visualizes trends in keywords, subject areas, and international collaboration. Specifically, this research aims to map the global evolution of podcast-related educational research and to highlight the positioning and contribution of agricultural field within this landscape.

2. METHODOLOGY

This study used a bibliometric approach to explore the development of scientific literature on the use of podcasts in education over the past two decades (2005-2025). The main objective of this study is to identify research trends, scientific collaborations, and the main themes that have developed on the topic based on keywords ([Hallinger & Kovačević, 2023](#)). We conducted the analysis using the VOSviewer software (version 1.6.20, released on October 31, 2023). VOSviewer (VOS, visualization of similarities) is a tool that enables the mapping and visualization of bibliometric networks using a distance-based approach based on publication metadata, and it is freely accessible ([Bukar et al., 2023](#); [N. J. Van Eck & Waltman, 2011](#); [N. J. van Eck & Waltman, 2014](#); [N. Van Eck & Waltman, 2009](#)).

2.1 Sources and Data Search Strategies

Data were obtained from the Scopus database. Scopus is one of the indexed databases for academic purposes. The search strategy used a combination of the keywords (podcast OR podcasts OR podcasting OR “podcast studies” OR broadcasting AND education OR teaching OR learning OR instruction OR training OR pedagogy). The search was focused on the author, title, and keywords sections and is limited to the time frame from 2005 to 2025. To maintain

the relevance and quality of the data, the inclusion criteria used are limited to journal articles only.

2.2 Data Collection and Processing

The search results yielded 3,660 documents that met the selection criteria, predominantly in English (91%). Additionally, we found a small number of journal articles published in Spanish, Chinese, German, Russian, and French. Moreover, the metadata of the articles were downloaded in “.csv” format, including information such as the article title, author names, institutional affiliations, indexed keywords, journal source, and publication year. Furthermore, we do not apply any special treatment to the acquired data. The VOSviewer software then imports the data for analysis, visualizing it as a network map. There are two types of mapping applied, namely author collaboration and co-occurrence of keywords (Du et al., 2024). The stages of data analysis refer to the research of N. J. Van Eck & Waltman (2011) and Du et al. (2024).

2.2 Types and Procedure of Bibliometric Analysis

Three main methods were employed for analysis.

- a. We analyzed the co-occurrence of keywords in podcasts and educational studies to pinpoint important terms and popular subjects. This study employs 12,764 keywords from the indexed keyword and establishes a minimum threshold of 100 occurrences to exclude less representative terms, resulting in 35 keywords.
- b. We analyze collaboration tendencies among researchers using co-authorship examination by country. We examine researcher collaboration through co-authorship analysis. This study involved numerous countries and identified 183 of them. The minimum number of documents for a country is 5 documents, resulting in 73 countries being related, but 72 are connected.
- c. We analyzed document data categorized by year, subject, and journal publisher from Scopus using Excel. Scopus offers annual statistics on document uploads, subject areas, and journal publishers. Also, we represent data using bar and line graphs.

Furthermore, we use the fractional counting method in both analyses (numbers 1 and 2). We apply this method to ensure that each calculation carries a proportionate weight. So that the visualization results are not overly dominated by huge or frequently cited publications, ultimately providing more balanced and representative results (Perianes-Rodriguez et al., 2016; N. J. van Eck & Waltman, 2014). VOSviewer automatically colors network visualizations to distinguish thematic clusters or time dimensions.

3. RESULTS AND DISCUSSION

In this section, we will discuss two main points: first, the evolution of podcast-related educational research from 2005 to 2025. Second, the role and contribution of agricultural fields within global podcast-related educational research.

3.1 The Evolution of Podcast-Related Educational Research (2005-2025)

In this subsection, the evolution of podcast-related educational research will be discussed, including annual scientific article production, the distribution of publications based on fields of study and sources, keyword overlay and network visualization, and the network visualization of co-authors by country.

3.1.1 Annual Production of Scientific Articles

Figure 1. shows there was an increase publications from 32 in 2005 up to 449 on 2024. There was significant increase in publications observed in 2019 to 2024 as also reported by [del Pino-Espejo et al., \(2022\)](#) with the majority of journal articles were written in English (91%).

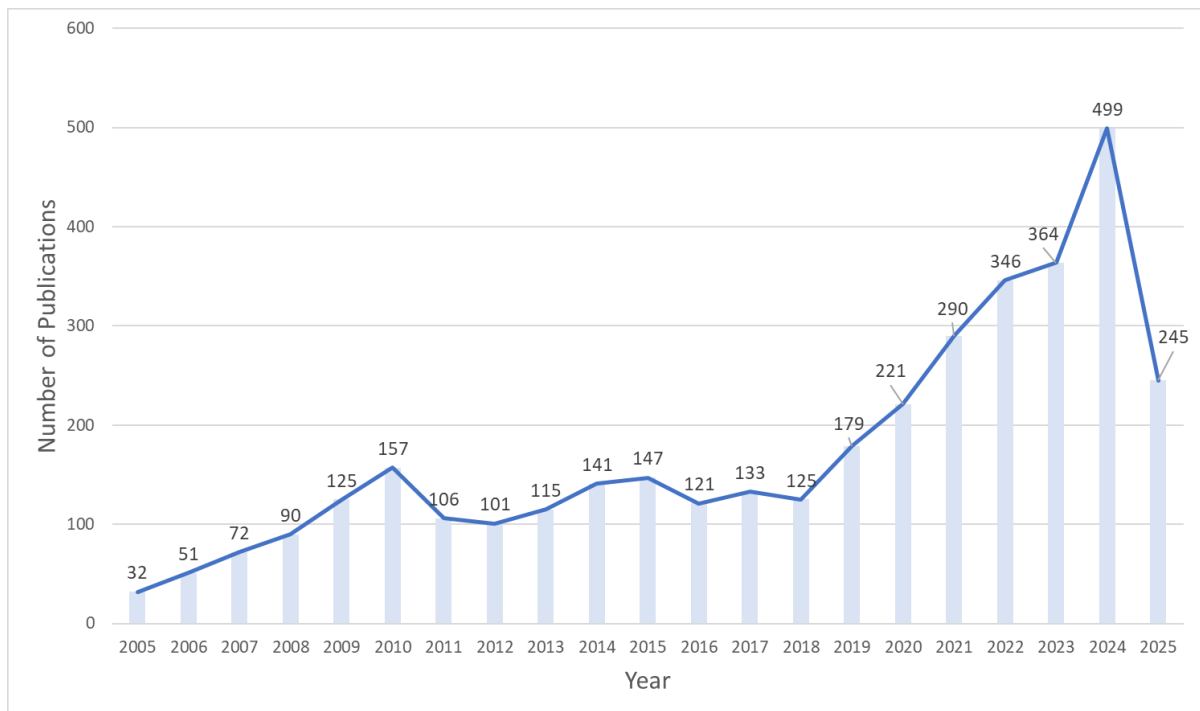


Figure 1. Annual Scientific Article Production

In 2020, when the covid pandemic happened, the education process was shifted from classroom into remote learning ([Ryan, 2024](#)) that [del Pino-Espejo et al., \(2022\)](#) reported the use of podcasts has become increasingly common during the outbreak. As [Okonski et al. \(2022\)](#) reported students from medicine discipline started asynchronous learning using podcasts to maintain physical distance.

3.1.2 Distribution of Publications by Subject Area

Figure 2. shows the distribution of publications based on subject area. Publication in social sciences had the highest number of publications, while publications in physics and astronomy had the lowest number. Moreover, several subjects were not included, namely biochemistry, genetics and molecular biology; earth and planetary sciences; agricultural and biological science; environmental science; chemistry; multidisciplinary studies; decision sciences; energy; and chemical engineering. This may be due to (1) the small volume of research in those areas, (2) the classification of interdisciplinary studies under broader categories such as social sciences or education, and (3) the relatively recent adoption of podcasting as a pedagogical tool in these fields. This finding highlights a potential research gap and suggests opportunities for further investigation into the use of podcasts in agricultural and other underrepresented domains.

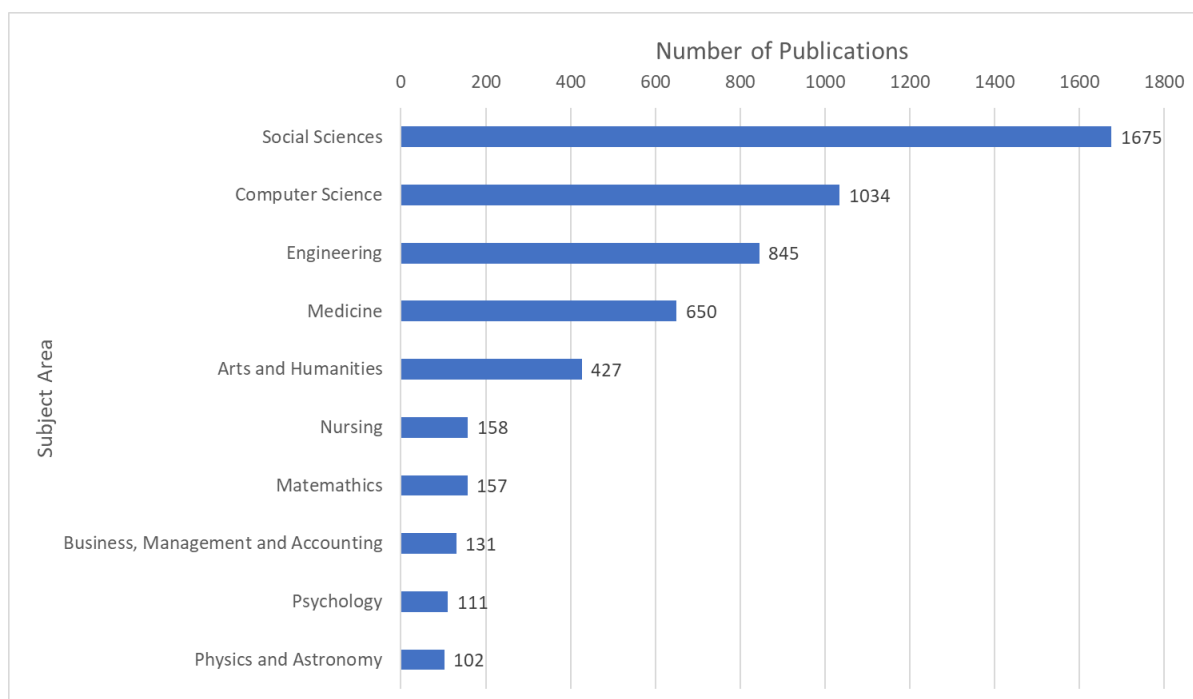


Figure 2. Distribution of Publications Based on Subject Area

3.1.3 Distribution of Publications by Source of Publication

Bibliometric analysis based on publication source was showed in **Figure 3**. The result showed that IEEE Access was the journal with the highest number of publications while IEEE Transaction and Communication was the lowest. The identified publication sources cover several fields and tend to be more multidisciplinary and interdisciplinary compared to previous research. We identified 150 more fields that were not included. Previous research revealed the dominance of the health field (del Pino-Espejo et al., 2022).

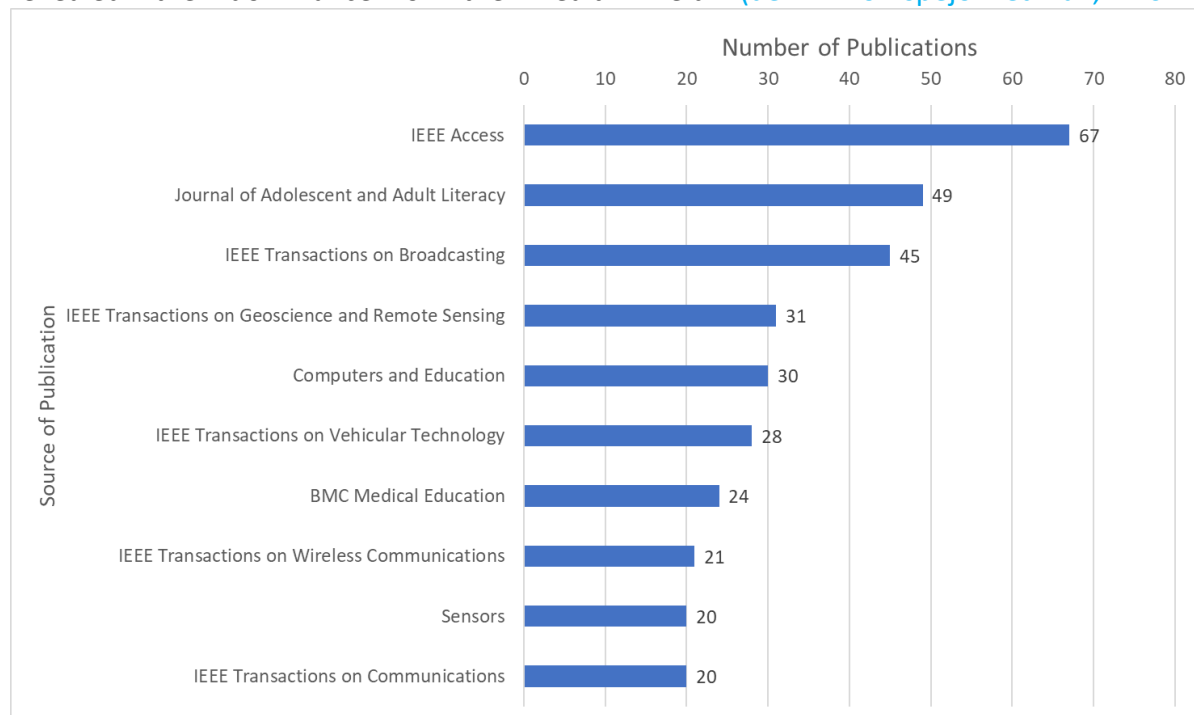


Figure 3. Distribution of Publications Based on Publication Source

3.1.5 Visualization of Co-Author Networks

Figure 5. shows most authors are United Nation Citizens with 1,084 publications and 22,685 citations. There were 109 countries that were not included in this analysis. Meanwhile, Indonesia contributed to podcast-related research with a total of 58 documents and 254 citations.



Figure 5. Visualization of Co-Authorship Network

This distribution signifies that collaboration occurs among specific groups concentrating on identical subjects across various domains. It indicates that, despite the presence of notable authors, the literature is also enriched by contributions from diverse researchers affiliated with various institutions and collaboration networks. Nevertheless, the interrelation of co-author networks persists in defining them (as depicted in **Figure 5**); this occurrence may be linked to the subject area, as most authors collaborate with peers within the same nation. There is inadequate collaboration among global authors. [del Pino-Espejo et al. \(2022\)](#) contended that the interrelation of these affiliations will reveal a common theme within the discipline.

3.2 The Role and Contribution of Subject area of Agricultural within Global Podcast-Related Educational Research

Related research shows that podcasts have been used in formal education, extension services, science communication, and community outreach in agriculture. Only eight agricultural documents were thematically evaluated out of 75 in the agricultural and biological sciences category. These studies cover food chemistry education in Ireland, biosecurity extension in Australia, and nutrition behavior in Nigeria. **Table 1.** shows some common podcast themes despite different topics.

Table 1. Thematic Synthesis of Podcast Use in Agriculture-related Studies (2014-2024)

No	Theme	Purpose/Function of Podcasts	Context/Example Studies	Key Insights
1	Formal Education & Content Delivery	Delivering course content; supplementing lectures; enhancing learning autonomy	Dunne (2014); Barnes et al. (2021)	Effective in low-bandwidth settings; supports independent learning and deeper engagement
2	Extension Services	Real-time information sharing; emergency communication; sustaining engagement	Wright et al. (2018); Greene et al. (2020); Eastwood et al. (2022)	Valuable in rural areas and crisis contexts; enables continuous communication with stakeholders
3	Science Communication & Learning Preferences	Simplifying complex topics; aligning with auditory learning styles; outreach	Lim & Swenson (2021); Aenlle et al. (2023)	Supports inclusive learning; useful in underrepresented or resource-constrained settings
4	Behavioral Change	Promoting awareness and behavioral change (e.g., nutrition)	Fadairo et al. (2024)	Reinforces health/nutrition messages; enables consistent delivery of key messages

Table 1. illustrates that podcasts serve multiple important functions in agricultural fields. In formal learning settings, they serve as accessible instructional tools that can supplement or replace traditional lectures, especially in low-bandwidth environments where video is impractical. These applications support deeper engagement and self-paced learning among students, particularly in scientific and technical courses. In the domain of extension and rural outreach, podcasts have proven useful for delivering timely and location-relevant content to farmers and agricultural professionals. They are particularly effective during emergencies or biosecurity crises, such as disease outbreaks, where fast, widespread communication is critical. The studies reviewed emphasize the practical advantage of podcasts in ensuring knowledge continuity, especially in contexts where physical extension services are disrupted or limited. Podcasts have also gained recognition as science communication tools that align with various learning preferences. Podcasts are easy to use, portable, and have the potential for storytelling, which allows for broad engagement with public audiences, especially in areas where workshops or printed materials may not reach. Finally, in behavioral change interventions, podcasts contribute to knowledge improvement and attitude shifts, particularly when integrated with nutrition education and public health efforts.

Furthermore, these findings demonstrate that podcasts are more than a passive media format—they function as pedagogical, communicative, and behavioral tools in a range of agriculture applications. The synthesis presented here offers a transferable framework for researcher, educators, and extension professionals seeking to design podcast-based interventions, particularly in settings constrained by infrastructure or access.

4. CONCLUSION

This study mapped the global landscape of podcast-related educational research from 2005 to 2025 through a bibliometric analysis of 3,660 Scopus-indexed publications, revealing a steady growth in scholarly interest, particularly within social sciences and computer science domains. Despite the breadth of coverage across subjects areas and countries, the agricultural domain remains notably underrepresented. A thematic synthesis of selected agricultural-related studies highlighted that while limited in number, podcasts have been meaningfully applied in agricultural domains—as tools for low-bandwidth learning, extension services, science communication, and behavior change. These application underscore the adaptability and inclusive nature of podcasts in rural, infrastructure-limited settings. However, the broader bibliometric landscape suggests a missed opportunity for deeper integration of audio media in agricultural, vocational, and engineering education, especially in supporting practical skill development and workplace-based learning. Future research should bridge this gap by exploring podcast effectiveness in these underrepresented fields, positioning audio-based learning as a strategic medium for inclusive and scalable education.

5. AUTHORS' NOTE

The authors state that there is no conflict of interest related to the publication of this article. Moreover, during the preparation of this article, the authors utilized QuillBot for language editing, particularly to improve grammar and enhance readability. The content has undergone editing and review, and the authors are fully responsible. Finally, the authors declare that this article is free from plagiarism.

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