



A Decade of Growth in Outdoor Education Research: A Bibliometric Study Based on the Scopus Database 2014–2024

Muhammad Husni Mubarak¹, Mustika Fitri²✉

School of Postgraduate Studies, Sports Education Study Program, Universitas Pendidikan Indonesia, Bandung, Indonesia^{1,2}

hmubarak@upi.edu¹, mustikafitri@upi.edu²

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Abstract

This study presents a comprehensive bibliometric analysis of scientific publications with the aim of identifying publication trends, citation trends, the journals with the highest number of publications, researcher tendencies, as well as network visualization, overlay mapping, and the geographical distribution of research on the topic of outdoor education. The research employed content analysis, conducted through online searches using the Scopus database and analyzed with VOSviewer software version 1.6.20. The research procedure followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow, including the stages of identification, screening, and eligibility assessment, covering data from 2014 to 2024. The findings indicate a year-over-year increase in publications related to outdoor education. Network visualization successfully identified several dominant topics in this domain, such as the connection between outdoor education and outdoor learning, although no linkage to psychological aspects has yet been observed. Therefore, new research opportunities may lie in integrating outdoor education with psychological studies. Overlay visualization was used to explore emerging research trends, indicated by yellow-colored terms such as outdoor learning and early childhood education. Overall, the number of scientific publications has shown significant annual growth, as has the number of article citations.

Correspondence E-mail✉: mustikafitri@upi.edu
Jl. Dr. Setiabudhi No. 229, Isola, Sukasari,
Kota Bandung, Jawa Barat 40154, Indonesia

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INTRODUCTION

Since the beginning of the 21st century, rapid advancements in modern urban development and digital technology have led to a decline in human interaction with the natural environment (Dong & Geng, 2023). The educational paradigm requires recognition of each individual's uniqueness, the development of their distinctive potential, and the pursuit of conditions that support the realization of their personal capabilities (Aulia et al., 2022). One such condition for actualizing personal potential is through outdoor education (Muhtadi, 2023). Outdoor education encompasses specific resources, forms, and methods of learning that are not based on the delivery of knowledge through theoretical approaches, but rather through direct experiential engagement (Jirásek & Turcova, 2017). Activities in outdoor education are typically experiential in nature, involving direct engagement such as nature exploration, camping, outdoor sports, ecological observation, and environmentally-based projects (Zulfriman et al., 2024). The aim is not only to enhance academic knowledge but also to foster social skills, leadership, collaboration, mental resilience, and environmental awareness (Karisman, 2021).

Outdoor education, which involves educational activities conducted in natural environments, has been shown to effectively strengthen the human–nature connection and promote holistic development, making it an effective strategy for addressing mental health issues (Nurhayati & , Langlang Handayani, 2020). A substantial body of research confirms the positive effects of outdoor education on the cognitive, emotional, and behavioral development of children and adolescents (Ihsan

et al., 2019). Cognitively, outdoor education not only enhances attention (Kuo et al., 2019), but also fosters innovation (Almers et al., 2021), broadens mindset (Wonowidjoyo, 2022), and improves memory retention (Mohamed et al., 2021). From an emotional perspective, this form of education contributes to the development of empathy (Bengal et al., 2024), strengthens a sense of connectedness with both social and natural environments (Karisman, 2021), and helps reduce psychological distress (Molyneux et al., 2022). Behaviorally, outdoor education promotes prosocial actions and environmentally sustainable behaviors (Hutson et al., 2024). Furthermore, outdoor education is also defined as a learning system that includes adventure-based activities to foster personal and social growth (Mohamed et al., 2021).

Outdoor education plays a vital role in human development by promoting physical, emotional, cognitive, and social growth through direct interaction with the natural environment (Kuncoro & Aulia, 2024). This approach offers meaningful experiences that help individuals build resilience, enhance problem-solving abilities, and foster environmental awareness (Khasana et al., 2023). From childhood to adulthood, outdoor education encourages a deeper connection with nature, healthy lifestyles, and lifelong learning. In an increasingly digital and urbanized world, the relevance of outdoor education becomes even more critical in balancing technological advancement with human well-being, making it an essential component of holistic education and sustainable living (Aslanoğlu et al., 2025).

In recent years, this term and its implications have attracted considerable attention, particularly due to the diversity of its

scope (Bota-avram & Bota-avram, 2023). For instance, travel activities or field trips are integrated into the concept of outdoor education, with the hands-on practices conducted during these activities regarded as an effective approach to illustrate the connection between theoretical knowledge and everyday life realities (Avci, 2020). Therefore, scientific knowledge mapping that analyzes emerging research topics (Gao et al., 2022), especially in the field of outdoor education, provides a clearer understanding for researchers about current research topics and challenges, thus offering strong guidance for future research initiatives (Wolf et al., 2022).

Examining research in a specific field of study over a certain period is of significant value, not only for monitoring progress in the field but also for identifying shifts in the focus of topics that are currently attracting attention (Ogutu & Archi, 2023). Therefore, this study employs a bibliometric analysis approach. This allows for a systematic review of various studies within a specific topic, covering sample characteristics, research scope, and key reference articles (Juliarta, 2024; Linnenluecke & Marrone, 2020). In the study of a particular field, bibliometric analysis is viewed as the output of a series of processes involving the collection of information related to authors, journals, countries of origin, academic disciplines, keywords, and citation analysis (Öztürk et al., 2024). In other words, bibliometric analysis is a useful method for uncovering the latest literature in a specific area of study and provides a quantitative and visual approach to identifying trends and dynamics in scientific publications (Kumar, 2025).

The primary objective of bibliometric analysis is to uncover the overall structure of a

specific field or area by identifying the key concepts encompassed within it (Passas, 2024). This study aims to conduct a bibliometric analysis of research on outdoor education published in the last ten years, from 2014 to 2024.

METHOD

We begin this study by applying bibliometric analysis to compile a substantial body of literature related to outdoor education. Bibliometric analysis is an efficient approach for mapping the scope of scientific literature comprehensively, comparable to the systematic literature review method, ensuring the accuracy and validity of the data and findings produced (Wang & Su, 2020). Through this approach, researchers can gain a comprehensive understanding of the knowledge scope within a specific field, as well as recognize trends, patterns, and connections between studies conducted (Kurdi & Kurdi, 2021). Bibliometric analysis provides researchers with the opportunity to trace collaboration networks between authors, countries, and research topics, allowing them to identify important linkages among these entities (Rahma et al., 2024).

In conducting the bibliometric analysis focused on the topic of outdoor education, we selected the Scopus database from Elsevier as the primary source for bibliographic research. With Scopus, we have access to various types of publications such as research articles, reviews, conference proceedings, and other related publications (Baas et al., 2020). The data obtained from Scopus allows us to analyze publication trends, identify the most frequently used keywords, and evaluate collaboration patterns among authors and affiliated institutions (Rami et al., 2023). Therefore, the use of Scopus

as the primary data source provides a strong foundation for tracing the evolution and dynamics of research in this field, as well as contributing to the identification of areas of study that have not been extensively explored and still require further research (Rejeb et al., 2025)

This study involves a comprehensive background analysis consisting of approximately 1,608 articles over a decade, from 2014 to 2024. By applying a scientific mapping approach, we reviewed the available literature and analyzed the bibliographic data obtained from various documents in the related field. Our analysis process is supported by bibliometric techniques, particularly in visualizing clustering through bibliographic coupling, which identifies the most highly cited recent documents on the topic (Donthu et al., 2021). The final outcome of this analysis is a literature review that provides recommendations and directions for future research based on the trends revealed from the bibliometric analysis.

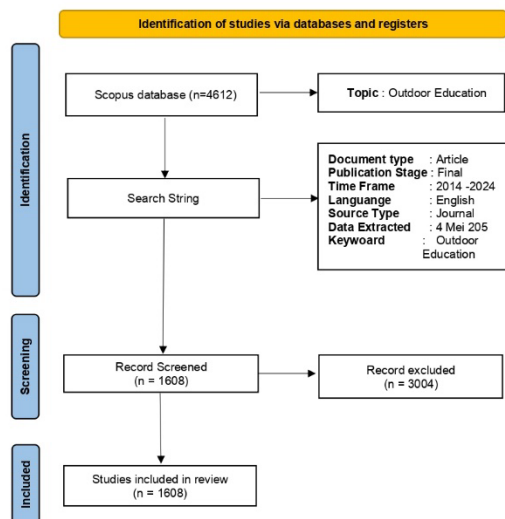


Figure 1. PRISMA Flow Chart of Search and Screening Strategy

RESULT AND DISCUSSION

This section presents a bibliometric analysis of the topic of Outdoor Education sourced from Scopus over the period from 2014 to 2024. Bibliometric analysis is a form of meta-analysis of research data that is useful for researchers to examine bibliographic content and analyze citations of articles published in journals or other scholarly works (Donthu et al., 2021). In this section, the results and discussion regarding the analysis of the Outdoor Education topic are outlined, with a focus on the number of publications, citation counts, classification by aspects (research fields, journals, authors), as well as network visualization, overlay visualization, and productive countries.

Number of publications

The search for scholarly articles on the topic of sports in tourism from 2014 to 2024 resulted in 4,612 publications, with an average of 146.2 publications per year. From 2015 to 2021, there was a yearly increase, but a decline occurred in 2022. Nevertheless, the number of publications rose exponentially again in the following years, with 2024 reaching the peak of the increase with 255 publications, as shown in Figure 2.

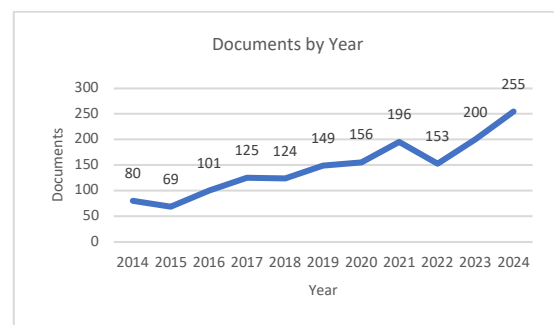


Figure 2. Number of publications on the topic of outdoor education, from 2014 to 2024.

Journal

The number of publications based on the keyword "outdoor education" across the top five largest journals can be grouped as follows: first, the National Science Foundation with 24 articles; second, the Government of Canada journal with 15 articles; third, the Norges Forskningsråd journal with 14 articles; fourth, the European Commission journal with 12 articles; and fifth, the National Institutes of Health with 10 articles. This is displayed in Figure 3.

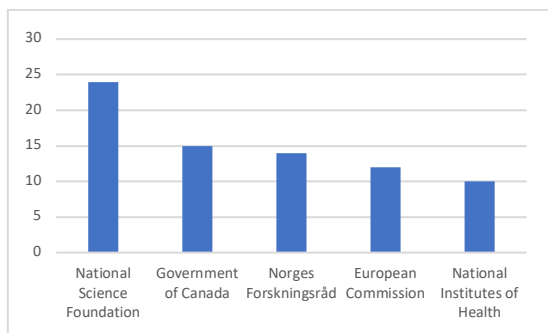


Figure 3. Number of publications on outdoor education reviewed from journals

Researcher

The number of publications based on the top 10 researchers can be presented as follows: the first author is Simon Beames with 14 articles and 261 citations. Next, Marcus Morse with 12 articles and 252 citations. In third place is Tonia Gray with 11 articles and 129 citations. The fourth author, Chris North, has 11 articles and 234 citations. Following that, Mads Bølling has 10 articles with 306 citations. Jim Sibthorp also has 10 articles with 208 citations, and Morten Asfeldt has 9 articles and 162 citations. Peter Bentsen has 9 articles and 278 citations. Scott Jukes has written 8 articles with a total of 107 citations, and finally, Ivo Jirásek also has 8 articles and 79 citations. The data related to Outdoor Education can be seen in Figure 4.

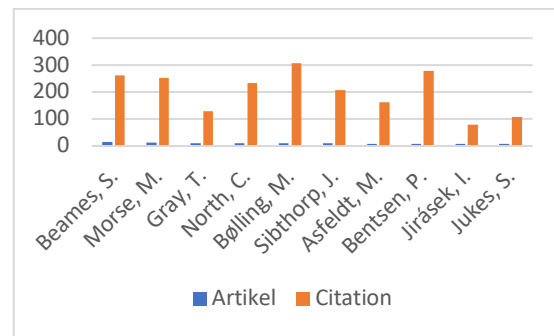


Figure 4. Number of publications on the topic of outdoor education as reviewed by researchers

Network visualization for co-occurrence

VOS viewer provides a network visualization map for co-occurrence, consisting of 51 items and 5 clusters. Below are the details of each cluster:

- Cluster 1 (14 items): climate change, conservation, demography, education, environmental education, forestry, higher education, nature conservation, outdoor recreation, psychology, recreational activity, sport, student, sustainability.
- Cluster 2 (10 items): air pollutant, air pollutants, air quality, environmental monitoring, indoor air pollution, indoor air quality, playground, primary education, primary school, primary schools.
- Cluster 3 (10 items): children, early childhood, early childhood education, forest school, nature, outdoor, outdoor play, physical activity, play, preschool.
- Cluster 4 (9 items): animals, greenspace, health, kindergarten, lifestyle, motivation, public health, science education, urban area.
- Cluster 5 (8 items): adventure education, experiential education, experiential learning, outdoor adventure education, outdoor education, physical education, teacher education.

As shown in Figure 5, when two terms are connected by a line, it indicates that these terms co-occur in titles and abstracts. Conversely, the absence of a connecting line signifies that the

terms do not appear together. Therefore, this network visualization map can be utilized by researchers to identify emerging topics within a particular field of study.

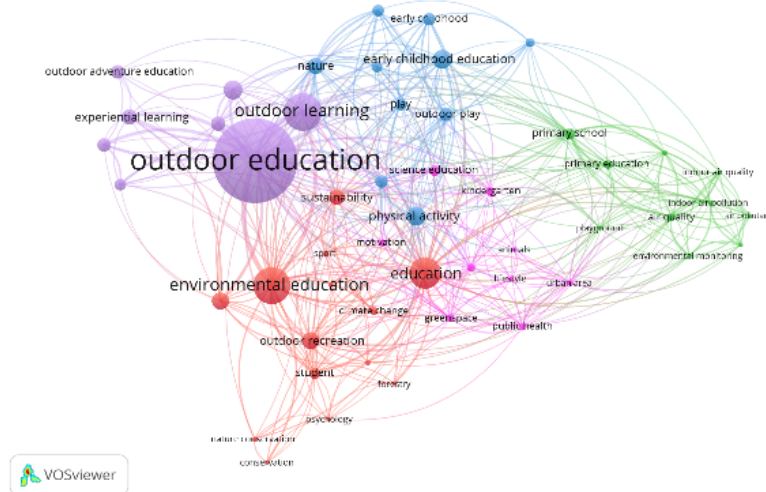


Figure 5. Network visualization on the topic of outdoor education

Overlay visualization for co-occurrence

In addition, VOSviewer provides an overlay visualization map that illustrates research trends in titles related to Outdoor Education over the period from 2014 to 2024, involving 51 terms. The yellow color in this visualization indicates research focuses or interests that are currently emerging. The figure above shows that concepts such as outdoor education, outdoor learning, environmental education, physical activity, early

childhood education, outdoor recreation, experiential learning, nature, and education were widely used in the literature up until 2021. The data also reveal that in recent years, keywords such as outdoor learning and early childhood education have become trending topics. The size of each circle represents the frequency of keyword usage, the color indicates the keywords that are often used together, and the lines between the circles represent connections between these keywords

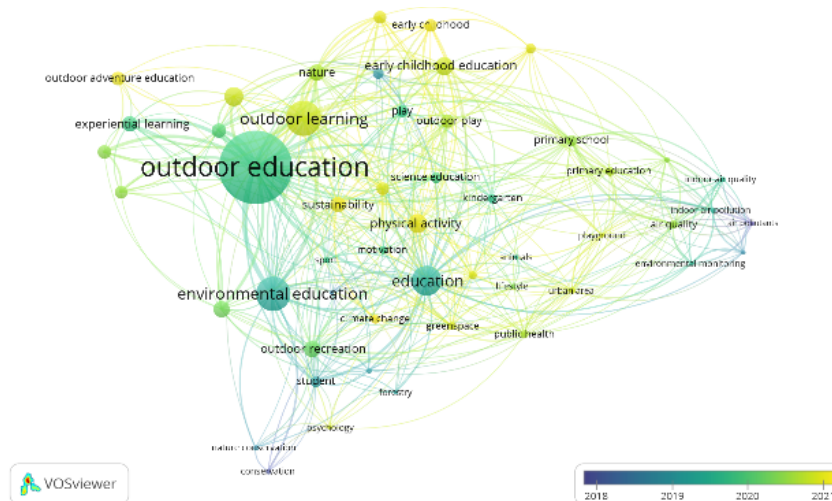


Figure 6. Overlay visualization on outdoor education

Geographic Distribution of Research in Outdoor Education

Table 1 lists the top 10 countries based on the number of documents produced in this field, with the United States ranking first with 405 documents, followed by the United Kingdom with 214 documents. Australia, Canada, and Norway contributed 180, 143, and 101 documents, respectively. Table 1 also presents the top 10 countries based on the number of citations, where the United States again ranks first with 5,084 citations, followed by the United Kingdom with 3,169 citations, while Australia has 2,453 citations, and Canada with 1,697 citations. Figure 7 illustrates the distribution of the collaboration network, highlighting the United States as the most central country,

followed by the United Kingdom, Australia, Canada, and Norway. These countries demonstrate strong academic collaboration and a significant presence in the field, reflecting the impact of outdoor education.

Table 3. Country, documents and citations

Country	Document	Cite
United States	405	5084
United Kingdom	214	3169
Australia	180	2453
Canada	143	1697
Norway	101	1387
Italy	62	793
Turkey	58	464
New Zeland	51	590
Sweden	49	663
Spain	48	386

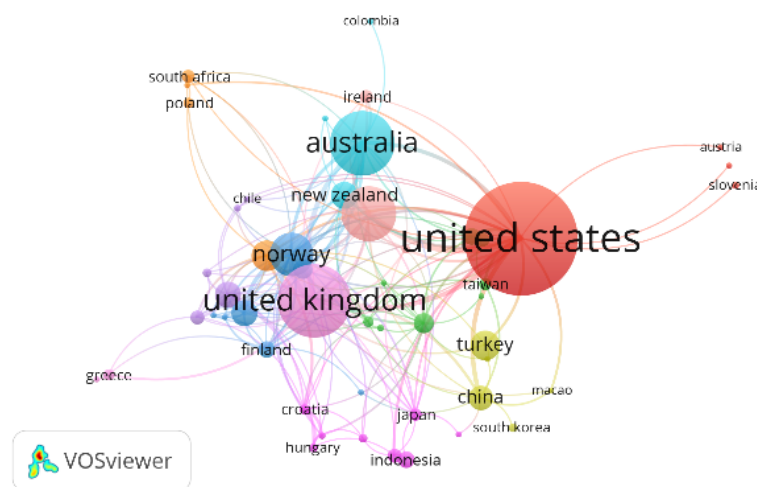


Figure 7. Most productive countries based on documents and citations

DISCUSSION

The document analysis results indicate that the number of publications in this field has continuously increased in recent years, reflecting the high interest and relevance of this topic among academics. This growth trend signals rising attention to the issues discussed, both in

theoretical and practical contexts. Furthermore, the abundance of research published in high-impact journals strengthens the position of this topic as a significant and sustainable academic focus.

Based on the analysis, several key terms frequently appear in research related to outdoor education. Topics such as outdoor education,

outdoor learning, environmental education, and physical activity dominate the literature, with early childhood education and outdoor learning emerging as increasingly prominent trends in recent years. Outdoor education for early childhood has become a rapidly growing research area. The interrelation among these terms suggests that these themes are interconnected and

reflect the interdisciplinary nature of research in this field. These findings reinforce the relevance and potential of outdoor education as a continuously evolving approach in the context of education and child development.

In terms of country contributions, the United States, the United Kingdom, and Australia are the top three nations with the highest number of publications related to outdoor education. This indicates that research on outdoor education is significantly advancing in developed countries with a strong focus on this area. These countries also exhibit robust collaboration with others in this field, as evidenced by their high citation counts and extensive international collaborative networks. The United States stands out with the highest number of citations, indicating its substantial contribution to the development of theory and practice in this domain. This analysis highlights the importance of international cooperation in expanding the global understanding of outdoor education.

The study also identifies several prolific authors who have made significant contributions to this field, such as Simon Beames, Marcus Morse, and Tonia Gray, each with numerous publications and substantial citation counts. The presence of these leading scholars has further advanced the field of outdoor education through

diverse approaches and perspectives, enriching the understanding and inclusive practices within sports (Melchior, 2023).

Despite the comprehensive bibliometric analysis applied in this study, several limitations warrant consideration. One limitation is the exclusive reliance on the Scopus database, which may exclude other relevant literature, including local studies from developing countries that are not indexed in this database.

CONCLUSION

This paper presents a comprehensive bibliometric analysis of publications on Outdoor Education indexed in the Scopus database from 2014 to 2024. The volume of scientific articles shows a significant upward trend, as evidenced by a consistent increase in annual publications. Similarly, the number of article citations has also increased. The highest number of publications was found in the Journal of the National Science Foundation, with 24 articles. Based on the sources containing the keyword "Outdoor Education," VOSviewer provided a network visualization map for co-occurrence, encompassing 51 terms across 5 clusters. In the visualization, the term "Outdoor Education" is linked to "Outdoor Learning," but not connected to "Psychology." Therefore, future research may explore novelty by investigating the relationship between outdoor education and psychology.

The overlay visualization map was used to observe research title trends related to outdoor education from 2014 to 2024, involving 51 terms. The analysis results indicate that the color yellow represents current research interests. Accordingly, the present research trends in the topic of outdoor education include yellow-colored terms such as outdoor learning and early

childhood education. Several prominent researchers, including Simon Beames, Marcus Morse, and Tonia Gray, have made significant contributions to establishing the theoretical and methodological foundations that enrich the scholarly discourse in this field.

From the keyword analysis, insights were gained regarding the development of publications since the first paper was indexed in the Scopus database. However, this study has certain limitations, as the theoretical document information was derived solely from titles, and the Scopus database is continuously updated with the latest publications. Therefore, bibliometric analysis related to information theory may need to be revisited in the coming years. Additionally, this analysis extracted scientific data exclusively from the Scopus database. Future research could include other databases to gain a broader understanding of studies on information theory.

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