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Loose Part Media Publications Based on Scopus: A Bibliometric Study

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ABSTRACT

Loose part media is part of children's learning. With this media, learning outcomes can be effective. This study aims to present the literature results related to loose part learning media. The data taken came from the help of the r studio program, which is bibliometric r-packages software. The type of data listed is journal articles. In this study related to loose parts, there were increases and decreases in publication numbers, and the highest production peaks in 2018 were 30 articles. The author who produces the most articles about loose parts media for early childhood is Cao, with 14 articles. The country that produces the most articles related to loose parts is the USA, with 332 articles. Most author affiliations are at the Korea Atomic Energy Research Institute, growing from 2007 to 2023, producing 63 articles. The topic trend is that more and more researchers are using loose part materials in various fields, which will make the research carried out more meaningful and more up-to-date.

Keywords: Bibliometric; loose part media; publication trends

1. INTRODUCTION

Media is a teaching material that assists educators in delivering lesson content (Maria, 2016). Instructional media plays a crucial role in the implementation of a learning process. The use of instructional media greatly aids in making the learning process more engaging and enjoyable for learners, as they can appreciate each piece of content provided (Gunawan et al., 2019). Nowadays, various instructional media is available, ranging from electronic to tangible forms of learning media. Educators frequently utilize various forms of media to facilitate optimal learning experiences. One of the various types of learning media used is loose parts media. It is a media used to help solve issues experienced by young children. It primarily utilizes different shapes and objects found in the surrounding environment. This media can be used as an alternative to reduce expenses associated with using learning aids (Pramudyani & Indratno, 2022).

A bibliometric study explicitly discussing the use of loose parts media has not been conducted yet. Bibliometrics is a library and information science research method that utilizes quantitative analysis and statistics to address research questions (Widiawati et al., 2022). Bibliometrics involves the application of mathematical and statistical methods to information recorded in journals or books (Herdianto et al., 2021). The use of bibliometric methods provides valuable information in research. The bibliometric analysis offers several benefits, including analysis of popular topics or trends in research conducted within a specific field of study or across different areas, providing empirical evidence of the impact of research, generating emerging findings and identifying new developments, discovering potential collaborators or partnerships for research, identifying suitable sources for publication purposes (Y. Guo, 2020). By employing bibliometric analysis, researchers can gain insights and make informed decisions based on quantitative data and trends in the scholarly literature.

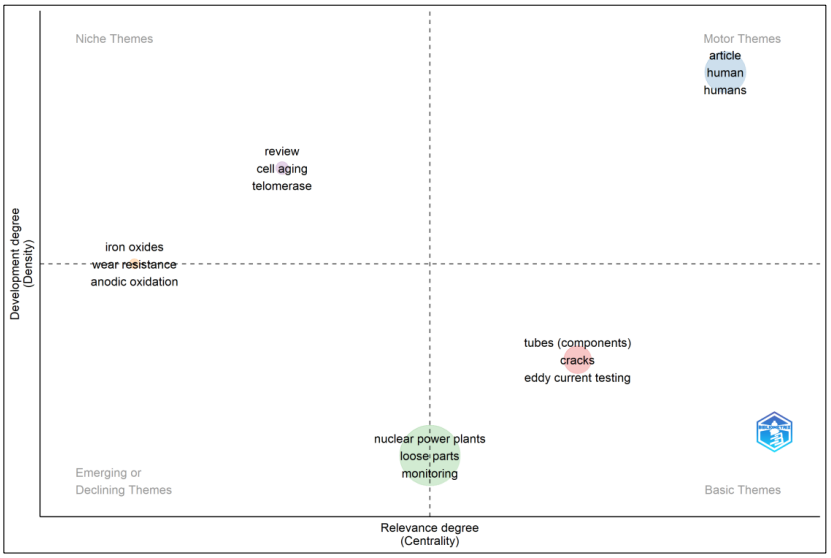


Figure 1. Research gap loose part media

Figure 1 does not fully capture the connection between loose parts media and children or humans. This means there is no connection between loose parts and humans or children. The use of loose parts is primarily associated with monitoring nuclear power plants, and its direct application in education is not clearly established. This indicates the need for additional research to explore the potential connection between loose parts media and children in an educational context.

This study uses bibliometric analysis to analyze the trend of loose parts media based on Scopus data, considering its increasing popularity among educators and its publication in Scopus-indexed sources. It is worth noting that no previous bibliometric study on using loose parts media, based explicitly on Scopus data, has been conducted. Therefore, the research aims to provide an overview of the utilization of loose parts media and analyze various aspects, including the annual scientific journal publications, relevant authors, countries, affiliations, sources of information, classification of instructional media, and the thematic map of loose parts media. The findings of this research will allow future researchers to identify relevant studies and address challenges in the field, both nationally and internationally.

2. METHODS

For this research, searches were conducted using the Scopus database available at http://www.scopus.com. Scopus is a comprehensive collection of citations and abstracts from peer-reviewed journals and reputable websites. It is recognized as the largest database globally and encompasses many periodicals published in languages other than English. Utilizing Scopus provides the advantage of retrieving high-quality journal results that are relevant for academic purposes during searches. This is because each journal listed in Scopus goes through a thorough evaluation process by the Content Selection Advisory Boards (CSAB), which are made up of eminent academics and librarians from various fields (Supinah & Soebagyo, 2022).

R Studio is used in this study, a computer program for bibliometric analysis and visualization. R Studio is an integrated development environment (IDE) that is built upon the R programming language. It provides a user-friendly interface and a range of tools for data analysis, including bibliometric analysis. This program analyzes the obtained data from the database and presents bibliometric maps (Zardari et al., 2022). The data collection process involved accessing the Scopus database without imposing any restrictions on the time period or authors. This allowed for a comprehensive data collection, resulting in approximately 393 entries. The search was conducted using the keyword "loose-part," which encompassed the publications' title, abstract, and keywords. The collected data contained all research related to loose parts. The data collection was carried out on March 8, 2023, utilizing the Scopus database, and a total of 393 data entries were obtained by performing a keyword search for "loose part" on the Scopus website, as seen below.

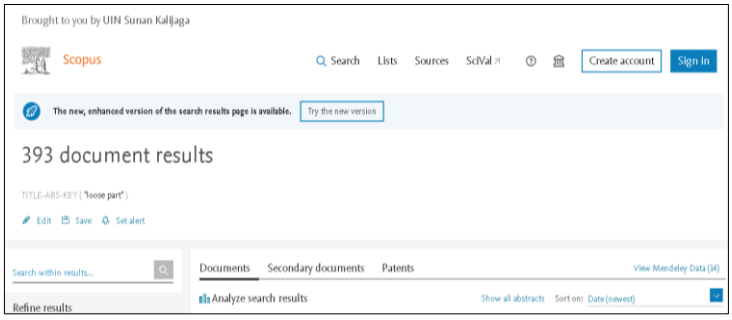


Figure 1. Search results in Scopus

After downloading the data, the next step is to open the Bibliometric program in R Studio. The next step is to input the data and explore the data according to the main information, such as the country with the highest article production, the prolific authors in the field of instructional media, publishers of articles related to loose parts, thematic maps, and current research trends. The computer program helps visualize the research on loose parts using Bibliometrics by inputting the database into the program.

3. RESULTS AND DISCUSSION

Annual scientific journal publication on loose parts media

Annual scientific journal publication refers to the frequency of journal articles published within a specific period, typically measured yearly. This metric provides insights into the patterns and popularity of journal publications over time. It is done to assist researchers in observing the

patterns and popularity of journal publications from year to year (Afifandasari, 2023). The figure below illustrates the fluctuating production of scientific journals focused on loose parts instructional media, as documented in the Scopus database, from 1968 to 2022. Over this time frame, there have been notable increases and decreases in the publication of scientific journals pertaining to this topic.

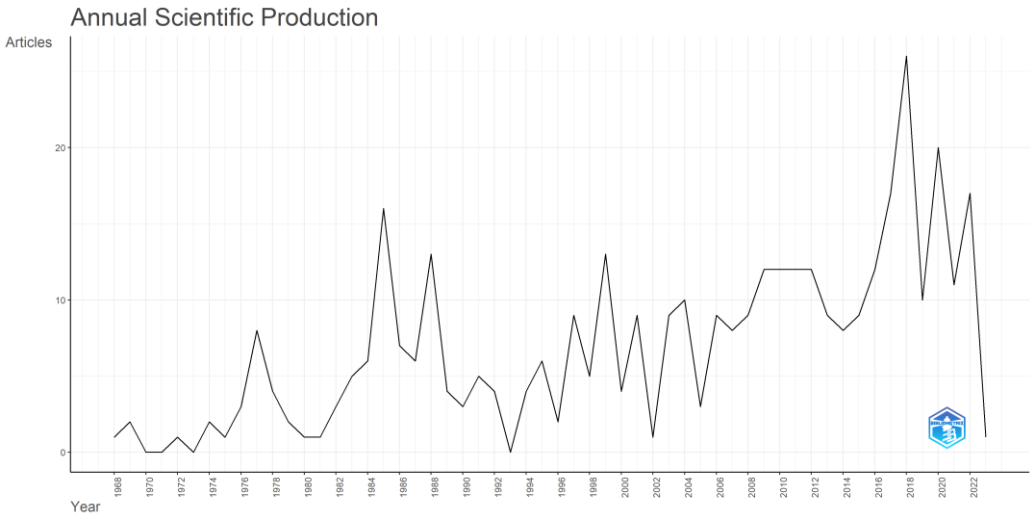


Figure 3. The annual publication production of loose parts pedia

Based on the figure, it shows the fluctuation in the number of publications about loose parts media. The peak of article popularity was in 2018, with 50 articles produced, followed by a decrease in 2020 to 20 articles produced annually. The trend of using loose parts media has been known since 1968 and has gradually gained recognition, although it is expected to experience fluctuations in popularity from year to year.

The most prolific authors

The most prolific authors are a list of authors whose written works related to loose parts are indexed in Scopus. The data generated is as follows.

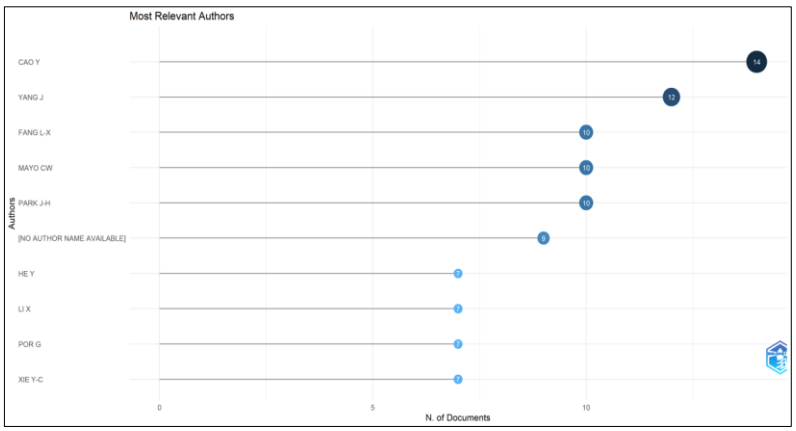
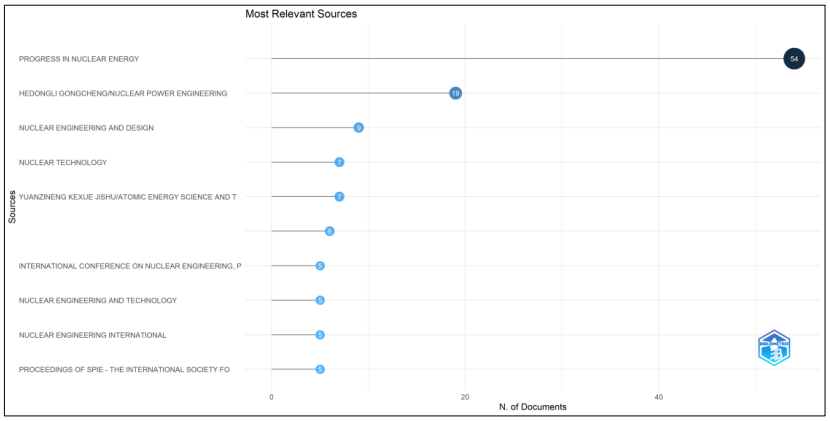


Figure 3. The most prolific authors

Cao emerges as the most prolific author in the field of loose parts, having contributed the highest number of works with a total of 14 journal articles. Following closely is Yang J with 12 articles. Three authors, namely Jang, Park, and Mayo, have each contributed ten articles. There are also nine articles credited to unknown authors. Furthermore, four authors, namely Li, Xi, Chen, and Cow, have each contributed seven articles. Based on this data, it can be concluded that Cao has produced the largest volume of articles related to loose parts, with a total of 14 articles.

The most relevant sources

The most relevant sources are data that show the most frequent sources in journal articles related to the use of loose parts.



Gambar 4. The most relevant sources

The most frequently used journal source for references related to loose parts is "Progress in Nuclear Energy," with a total of 54 articles published. "Hedongli" contributed 19 articles, followed by "Nuclear Engineering" with nine articles. Additionally, there are seven articles each from sources such as "Nuclear Design," "Youngchen," and "Youzhieng." Furthermore, "Nuclear Engineering International," "Engineering Technology," and "Proceedings SPIE" each have five articles. In conclusion, it can be inferred that the primary source for references on loose parts is "Nuclear Energy," with a total of 54 articles.

Publication countries

The publication countries are the countries that have produced the highest number of scientific works related to the use of loose parts.

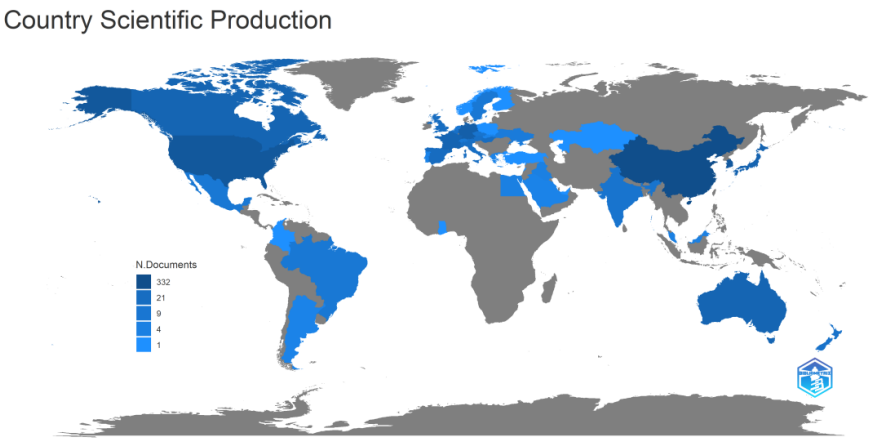


Figure 5. Publication countries

The country that produces the highest number of journal articles related to loose parts is the USA, with 332 articles published annually. Australia has produced 21 articles, Indonesia has produced nine articles, China has produced four articles, and Thailand has produced onle one publication. Therefore, it can be concluded that the USA is the country that produces the highest number of articles related to loose parts, with a total of 332 articles.

Publication affiliations

Publication affiliation refers to the affiliations of the authors who have contributed their works related to the use of loose parts.

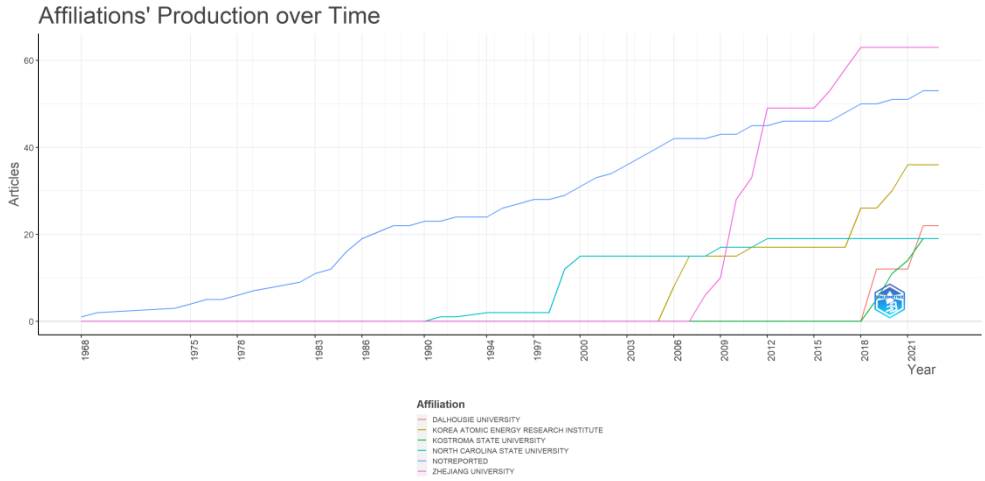


Figure 6. Publication affiliations

The line graph above illustrates the publication trends of various affiliations related to loose parts. Korea Atomic Energy Research Institute started publishing journals in 2007 and has shown rapid growth, starting with five articles and reaching a peak of 63 articles produced. Krostoma State has developed from 5 articles in 2006 to 21 articles in recent years. Dalhouse University began its growth in 2016 and has produced 5 to 35 articles annually. North Carolina State University has produced 4 to 45 articles from 1966 to the present. Northreported has produced 10 to 20 articles, with development starting in the 1990s. Zhejuang University

produced 30 articles in 2009. Therefore, it can be concluded that the affiliation with the highest number of publications is Korea Atomic Energy Research Institute, which has grown from 2007 to 2023, resulting in 63 articles.

Co-occurrence network

A co-occurrence network refers to a network that depicts the relationships between different themes or topics. In the context of loose parts, the co-occurrence network illustrates the associations and connections between loose parts and various other themes.

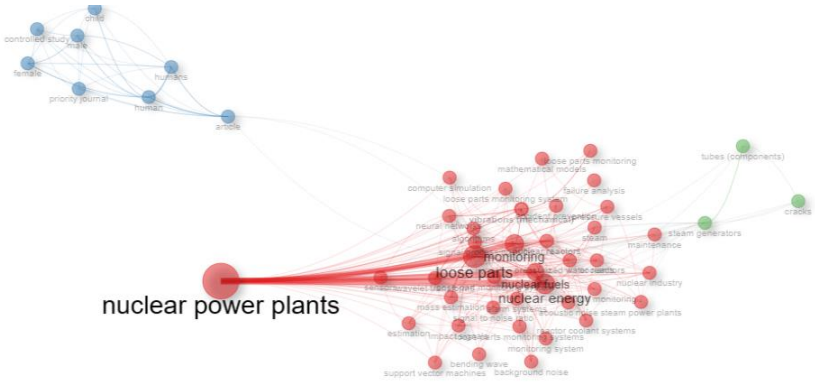


Figure 7. Co-occurrence network

The above diagram shows circular nodes with different colors, blue and red. The red circle represents the main topic, loose parts, while the blue circles represent related topics such as early childhood, humans, and other relevant aspects. However, there is a lack of clear connections between the red and blue circles. This indicates limited research on the relationship between loose parts and topics such as early childhood, humans, and other areas. In conclusion, loose parts can serve as a research reference as there is still a need for further exploration in various fields.

Thematic map

A thematic map is a map that illustrates the relationship between loose parts and various other topics. It visually represents the connections, patterns, and themes associated with loose parts concerning other elements. It may help provide a comprehensive overview of the different aspects and domains linked to the concept of loose parts. By analyzing the thematic map, researchers can gain insights into the multidimensional nature of loose parts and their intersections with other areas of study. This map is valuable for understanding loose parts' broader context and implications in different fields and domains.

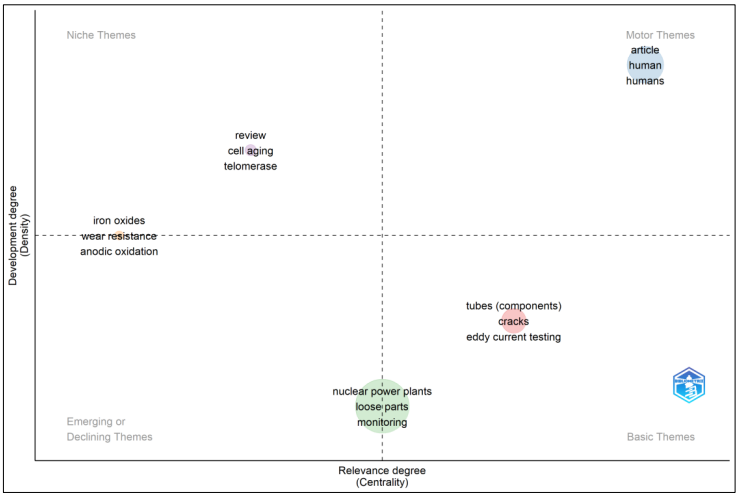


Figure 8. Thematic map

The above image depicts that there is a box pointing upwards and sideways. The meaning conveyed is that when a circle or theme is placed above, it signifies relevance, but excessive research has been conducted on it. When it is set on the right side, it indicates a relevant and needed theme that requires further study. In the image, loose parts are positioned in the bottom right corner, suggesting its relevance for investigation and the need for further exploration as many researchers have not extensively studied it.

Bibliometrics is a method used to measure the impact of research through quantitative indicators. These indicators complement qualitative indicators, such as funding, awards, and peer feedback. The quantitative and qualitative indicators collaborate to demonstrate the quality and impact of a research study (Y.-M. Guo, 2019). Bibliometric analysis is used to evaluate the utilization of collections, identify research trends in a specific topic, and assist in analyzing the needs of a teaching curriculum in library science programs. This method assesses researchers' contributions to the mission and vision, study topics, and overall performance of individuals and teams within a university (Tupan, 2022).

Bibliometrics is an activity that measures and analyzes information sources, including books and other forms, using mathematical and statistical methods. In conclusion, bibliometrics is used to analyze scholarly works (Nunen, 2018). The method of bibliometric analysis provides various benefits, including; analyzing popular topics or trends in research conducted in a specific field or across different fields of study, providing tangible evidence of the impact of a research study, uncovering emerging new findings, identifying potential collaborators or research partnerships, identifying suitable sources for publication (Y. Guo, 2020).

Based on the previous description, this research indicates fluctuations in the publication of articles on loose parts, with the highest production peak observed in 2018 with 30 articles. The author who contributed the most articles on loose parts is Cao with 14 articles. The country with the highest production of articles related to loose parts is the USA, with 332 articles. The most prolific affiliation is the Korea Atomic Energy Research Institute, which has shown significant growth from 2007 to 2023, producing 63 articles. The topic of loose parts across various fields is relevant and suitable for further research. The positioning of loose parts in the lower right quadrant indicates its relevance for investigation and the need for further exploration, as many researchers have not extensively explored it.

Media is a teaching aid that assists educators in delivering instructional materials (Maria, 2016). Learning media plays a crucial role in implementing effective teaching and learning processes. The use of learning media significantly enhances the learning experience, making it more engaging and enjoyable for students (Gunawan et al., 2019). Nowadays, a wide variety of learning media is available, ranging from electronic to tangible physical media.

Indeed, with the advancement of technology, educators nowadays tend to prefer using electronic media over tangible physical media. Electronic media refers to technology-based media, such as online games, that utilize current technological advancements (Sukmawati, 2019). On the other hand, tangible physical media refers to media that can be directly touched or interacted with, such as the physical objects available to children (Pebriana, 2017). The use of tangible physical media is currently less common, as educators lean towards electronic media. An example of tangible physical media is the use of loose parts as a learning tool.

Farikhah presents the results of her research on how loose parts can be used as an alternative learning tool for students to help address issues related to learning boredom (Farikhah, 2022). Naila explains the significant impact of using loose parts in helping educators address issues related to teaching critical thinking. With the use of loose parts in learning, children become more adept at critical thinking regarding their daily problems (Lia, 2022). Sri presents her findings that can assist educators in delivering new learning materials and enhancing students' interest in learning through the use of loose parts as a learning medium (Muryaningsih, 2021).

Loose parts media is a form of media that utilizes and harnesses objects found in the child's environment (Simon Harun & Rahardjo, 2022). Loose parts media emphasizes the principle of using natural learning aids (Priyanti & Jhoni Warmansyah, 2021). The purpose of using loose parts media is to introduce the beauty of nature to children and familiarize them with the concrete forms of objects, thereby fostering their critical thinking skills (Ridwan et al., 2022). However, the trend of using loose parts media is currently emerging and becoming known among educators. This is evidenced by data obtained from the Scopus database.

This research has several limitations. Firstly, it is constrained by limited keywords depending on the database used in Scopus. Additionally, this study utilized the formal analysis tool Biblioshiny, which may lead to identification errors. It is recommended that future researchers expand the sample size by broadening the keyword scope within accessible databases. Furthermore, bibliometric analysis software such as BibExcel and HistCite can be employed to compare results accurately.

4. CONCLUSION

Bibliometric analysis can serve as a reference to identify publication trends. In this research, it is utilized to examine the publication trends related to the use of loose parts in various fields. The study reveals that the publication of loose parts experiences fluctuations, with the highest production peak in 2018 with 30 articles. The most prolific author in loose parts is Cao, with 14 articles. The country that produces the most articles related to loose parts is the USA, with 332 articles. The affiliation with the highest number of publications is the Korea Atomic Energy Research Institute, which developed from 2007 to 2023 and produced 63 articles. The topic of loose parts in various fields is relevant and suitable for further research. Loose parts occupy the bottom-right position, indicating their relevance for investigation and the need for further exploration, as many researchers have not extensively studied them.

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