Proceeding International Conference on Religion, Science and Education (2025) **4**, 877-882

Bibliometric Analysis: Trends Research in Junior High School Natural Science Learning Based on Local Potential in 2021-2024

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Abstract: Bibliometric analysis can describe various kinds of relevant information about natural science learning in junior high school which is implemented based on local potential. The purpose of this study is to analyze literature on science learning in junior high school based on local potential using bibliometric analysis methods. Data collection techniques are carried out through the Harzing's Publish or Perish (PoP) application which is linked to the Google Scholar page. The search was carried out to obtain Indonesian-language articles published between 2021 and 2024 through three keywords, namely "Natural Science", "Junior High School", and "Local Potential". The data that has been obtained is then analyzed using VOSviewer to obtain a visualization of research trends. Based on the results of the study, it was found that natural science learning that is collaborated with local potential can have a positive influence on the learning and teaching process. The research map obtained shows a focus on the development and implementation of learning models, learning approaches, teaching materials, learning media, and management of science learning curriculum based on local regional potential. This research is expected to provide broader references regarding the development of science learning research as well as recommendations for education practitioners and researchers

Keywords: Junior High School, Local Potential, Natural Science.

Introduction

Education has various meanings broadly based on the interaction between students and educators in order to achieve the expected educational goals. Teachers and students form an interaction in a place called an educational environment. The environment includes the physical, social, and intellectual environment. The learning process and education have a relationship with values, educating means giving, growing, and instilling values for students. The meaning of providing values to students is that teachers play an active role in developing and maximizing their potential and abilities and characteristics towards a positive direction (Wardani & Sarjan, 2024). Based on the National Education System Law No. 20 of 2003, it is explained that the role and function of education is to develop, shape the character and develop the abilities of students, as well as build a dignified national civilization in order to educate the nation's life. Based on the laws and regulations, it can be known that efforts to develop the potential of students are all ways that will be done to create students who have faith, fear God Almighty, are healthy, knowledgeable, have noble morals, are capable, independent, creative, and become responsible citizens.

The achievement of learning objectives is inseparable from the process of implementing learning activities and teaching various subjects in the educational environment. Natural Sciences (IPA) is one of the studies that has a relationship with the environment, technology, and other fields. Science learning is not a discipline, but is developed as a subject that has mutual integration

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ISSN 2829-3355 | EISSN 2828-8467

between other fields. The relationship in science learning is the unity of chemistry, physics, and biology that are studied together(Suwandani, 2024). The science learning process also emphasizes aspects of knowledge, scientific attitudes, and science process skills. In addition, the implementation of science learning provides direct experience to students to develop and maximize their competence in exploring the surrounding environment scientifically. Thus, the science learning process will be more meaningful if it is collaborated with the conditions in the local environment with the conditions of students.

Based on the results of the literature review, the problem was obtained that in the research conducted by Wilujeng et. Al. (2019) explained that the process of science learning activities has not been pleasant for students, this is due to the lack of utilization of the potential of local wisdom in solving learning problems. In addition, the results of Nisa's research (2022) explained that the science learning process only utilizes learning resources from the government whose examples of problems are less relevant to the conditions of the local school environment, so that students are not enthusiastic because their interest in learning is not optimal. A similar problem also occurred in one of the private schools in the Prambanan area, Sleman, Yogyakarta that science learning activities have not fully integrated the local potential. Meanwhile, in the environment around the school, there are many regional potentials that can be utilized in the science learning process. These problems are very likely to occur in other regions because each region has advantages or potentials that can be used in the integration of science learning and contains aspects in both the fields of chemistry, physics, biology, and astronomy.

Local potential or local wisdom is a way of looking at life and knowledge of various life strategies in the form of activities or activities of local communities to solve and answer various problems in meeting their needs. In foreign languages, local potential is also conceived as "local wisdom", "local knowledge", and "local genious"(Fajarini, 2014). Each region has characteristics with its own potential advantages, but the potential possessed by each region will not have any usefulness for the local community if it is not utilized and processed properly. Thus, local potential needs to be mapped to see all available resources in the form of natural resources, social resources, and human resources so that they can be managed appropriately and have benefits for the community, including in teaching and learning activities (Mukhlis et al., 2023). The application of local potential-based learning is able to minimize students' learning obstacles because it contains activities or objects of activity that have been recognized by students. In addition, integrating local potential in these learning activities can create a memorable learning atmosphere and make students actively involved in providing positive responses to learning (Hasmiati et al., 2023). Therefore, science learning activities that involve the surrounding environment or local potential are able to optimize the learning process and outcomes of students.

Bibliometric analysis is an approach to examining developments from a research domain, including topics, authors, based on the social, intellectual, and conceptual structure of a particular discipline (Donthu et al., 2020). The analysis can be used by researchers to identify popular topics, leading researchers, articles that have a great influence on other research, as well as collaborative networks between researchers in the field of local potential applied in science learning in Junior High School (SMP). This information is very necessary to understand the direction of previous research with the research being conducted, as well as to identify gaps in the research that need to be completed. Thus, research through bibliometric analysis is needed to find out the update of research fields on local potential topics.

Materials and Methods

This research was conducted through bibliometric analysis to analyze the literature on science learning in junior high schools based on local potential. The data collection technique is carried out through the Harzing's Publish or Perish (PoP) application which is connected to the Google

Scholar page. Bibliometric analysis is used to find out research updates on local potential topics. The research steps carried out are the data collection and data analysis stages. The data used in this study is secondary data in the form of several articles related to science learning based on local potential in junior high schools.

The first stage of this research is data collection, several articles are obtained through the help of Harzing Publish or Perish (PoP) software connected to the Google Scholar page. The search was carried out to obtain Indonesian-language articles published between 2021 and 2024. The search uses three keywords, namely "Natural Sciences", "Junior High School", and "Local Potential". These keywords are used to limit the broad scope of article searches. The data that has been obtained is then saved using the ris format as analysis material using VOSviewer. The analysis process aims to obtain the results of visualization of research trends. The visualization results obtained from VOSviewer analysis include network visualization, overlay visualization, and density visualization. Based on the results of the visualization, this study is reviewed from the analysis of network visualization.

The data analysis methods used in this study are descriptive analysis and network analysis. Descriptive analysis presents the distribution of articles based on the results of the development of scientific article publications, the type of research used, and the article with the most citations. Meanwhile, network analysis is presented to identify the development map of several keywords that have emerged and become research trends.

Results and Discussion

The results of the research in the literature review with the focus on junior high school science learning research articles based on regional local potential, were obtained as follows.

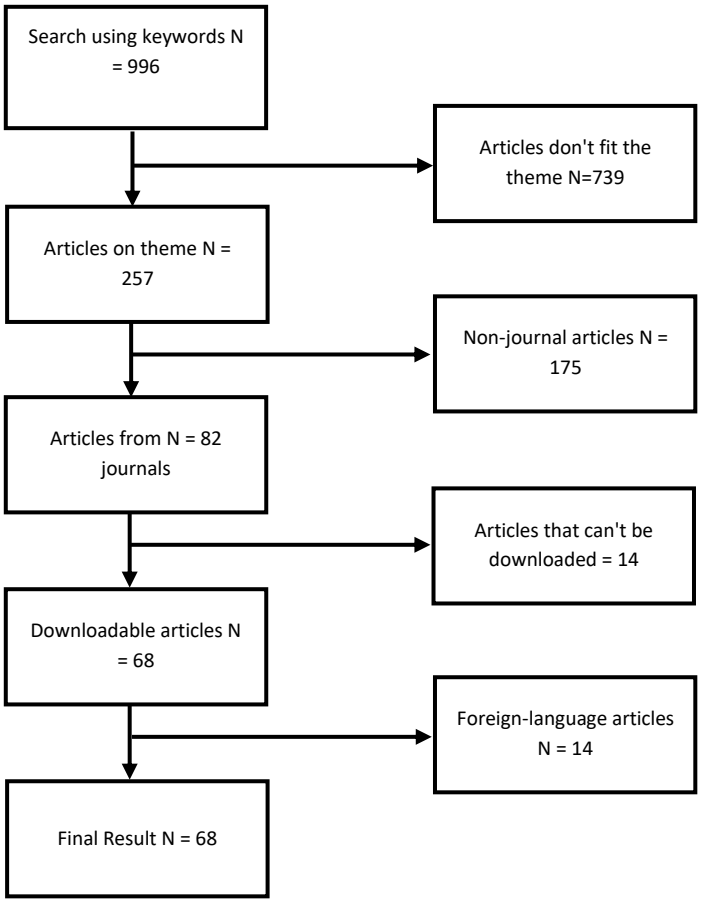

Figure 1. Steps to search article data

Based on the results of data filtering through the diagram above, the researcher conducted several analyses including the results of the analysis of the development of scientific article publications, the type of research, the articles that have the highest number of citations, and the development map of research trends described as follows.

1. Results of Analysis of the Development of Scientific Article Publications

Table 1. Results of Analysis of the Development of Scientific Article Publications.

Year	Number of Scientific Article Publications	Percentage
2021	9	13,24 %
2022	21	30,88 %
2023	21	30,88 %
2024	17	25,00 %

Based on the data obtained in Table 1. It can be known the results of research on junior high school science learning based on local potential for the last four years, namely from 2021 to 2024. The data shows a decrease and increase in the number of scientific article publications every year. The number of scientific articles published in 2021 was nine articles with a relatively low percentage. This is because the topic of science learning based on local potential is starting to develop. Then in 2022 and 2023 the number of scientific article publications has increased with the same quantity, namely 21 articles. The increase is due to the increasing understanding in collaborating science learning concepts with the surrounding environment or the potential of the local area. In addition, the development of research that has occurred also encourages researchers and educators to develop local potential by exploring innovative learning models and methods.

However, in 2024 there will be a decrease in the number of scientific article publications to 17 articles. The decline was caused by several factors. This research was carried out in mid-2024, so it is very possible that there are still other research articles that have not been published. In addition, another factor that causes the decline in the number of publications of other scientific articles is the increase in the focus of research that is currently developing in the field of technology and digitalization. Based on the results of the analysis that has been carried out by the researchers, it can be seen that the trend of junior high school science learning research in collaboration with local potential shows increased interest in 2022. The fluctuation of research trends is influenced by several internal and external factors so that it has an impact on the priorities in the research conducted.

2. Results of Research Type Analysis

Table 2. Results of Research Type Analysis.

Type of Research	Number of Studies	Percentage
Kualitatif deskriptif	24	35,29 %
RND	16	23,52 %
Literatur review	11	16,17 %
Eksperimen	10	14,70 %
Survei	7	10,29 %

Based on the result data presented in Table 2. It can be interpreted that research on junior high school science learning that is integrated with local potential is researched with various research methods. The accumulation of all result data, as many as 24 research articles were obtained using a descriptive qualitative method that provides an expansion of insights related to relevant research and follows the development of real conditions in the research environment. This causes descriptive qualitative research methods to be widely applied in research. Meanwhile, the type of development research or RND has 16 articles that are developed based on conditions or problems in science learning. These problems require a solution to improve the expected results or goals through the development of models, methods, and teaching materials. Then, the research of the literature review method was obtained as many as 11 articles that reviewed the gaps and trends that are occurring in order to evaluate and update the research. The experimental research method was developed in 10 articles that reviewed the effectiveness of high school science learning integrated with local regional potential. Based on the results of the research using this method, significant differences can be found through research in the experimental class and the control class. In addition, the research method through the survey is contained in seven research articles

because the simple method in the analysis process and research sampling can be adjusted to the character of the target population.

3. Results of Article Analysis with the Most Citations

Table 3. Results of Article Analysis with the Most Citations.

No	Title	Author's Name	Number of Citations
1	Peningkatan Keterampilan Guru IPA dalam Mengembangkan Media Pembelajaran Inovatif Berbasis Potensi Lokal	(Suryanda et al., 2021)	21
2	Pengembangan E-book Interaktif Materi Kesastraan Berkearifan Lokal Pulau Mandangin Berbasis Aplikasi Flip PDF Professional	(Setyawan & Faqih, 2023)	9
3	Kajian Etnofisika Pada Tari Piring Sebagai Media Pembelajaran Fisika	(Astuti & Bhakti, 2021)	7
4	Pelatihan Pembelajaran STEM (Science, Technology, Engineering and Mathematics) Berbasis Potensi Lokal Bagi Guru di SMPN 3 Batukliang	(Busyairi et al., 2022)	4
5	Pemanfaatan Tanaman Goloka sebagai Sumber Belajar Berbasis Potensi Lokal melalui Penyelidikan IPA pada Siswa Kelas VII SMP Negeri 1 Sape	(Hidayat, 2023)	4

Table 3 interprets the results of the research with the topic of high school science learning with local potential in the region with the most citations in 2021 to 2024. The research entitled "Improving the Skills of Science Teachers in Developing Innovative Learning Media Based on Local Potential" has the most citations with 21 citations. The research was widely cited because it contained a concrete explanation of the conditions of science learning. Another article discusses aspects of junior high school science learning based on local potential in collaboration with developers of interactive learning media and STEM approaches. Overall, the research has a positive impact on various aspects of science learning in junior high schools so that it provides benefits for other researchers.

4. Results of Analysis of Research Trend Development Map

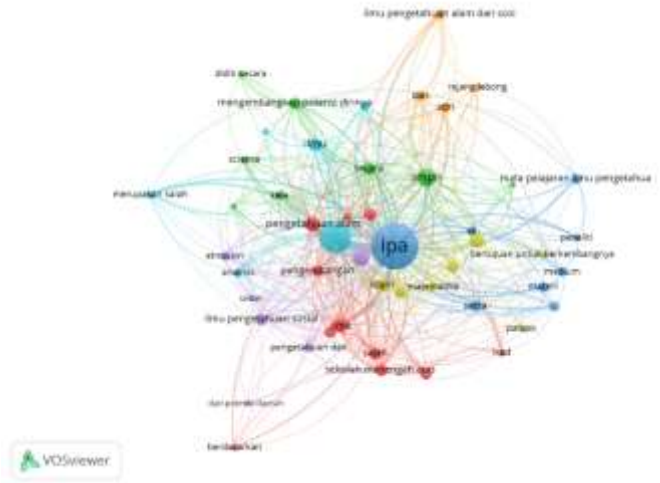

Figure 2. The Network Visualization

Based on the results of mapping through the VOSviewer application, the results are obtained as shown in Figure 2. which is reviewed based on the network visualization, including nodes (colored

circles) and connections that represent themes and relationships with each other. The results show that science becomes a central node that is connected to other nodes, thus showing the relationship between other research topics. The dominant node of the visualization is "Natural Knowledge" because it is in accordance with the main topic of the research, namely science. However, in this study, there are limitations, namely the visualization results obtained have not depicted specific nodes and connections due to system errors in detecting article data. However, these results can provide an overview of research mapping on junior high school science learning based on local potential and develop researchers' contributions in developing other topics according to the nodes that are connected.

Conclusion

Based on the results of bibliometric analysis reviewed from 2021 to 2024, it was found that science learning in collaboration with regional potential can have a positive influence on the teaching and learning process. The research map obtained shows a focus on the development and implementation of learning models, learning approaches, teaching materials, learning media, and the management of science learning curriculum based on regional potential. This research is expected to provide a wider reference for the development of science learning research as well as recommendations for education practitioners and researchers.

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