

RESEARCH TREND OF LOCAL WISDOM IN PHYSICS EDUCATION FROM 2018 TO 2022: A BIBLIOMETRIC REVIEW AND ANALYSIS

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Abstract

This article was written to analyze research trends on local wisdom of Physics Education in the last five years, 2018 - 2022. The method used is Bibliometric analysis, assisted by the VOSviewer application. The object of study is the title and abstract of 428 scientific articles from international journals indexed by Scopus in the last five years. The data was obtained using the keyword "local wisdom in physics education." The results show how the network, overlay, and density between parts. The visualization results show that local wisdom in learning, especially physics learning, has a great opportunity, especially with the existence of local wisdom in the independent curriculum in Indonesia. The school level has the potential to lead to innovation in learning.

Keywords: Bibliometrics, Local wisdom, Physics education.

1. Introduction

Culture results from values, attitudes, and traditions that continuously last for a long time. The process of its course comes from the strong relationship between the human habit of observing phenomena and the signs of nature. Habits continuously give birth to perspectives, knowledge, beliefs, and customs that affect the citizen's daily activities is called local wisdom [1]. The diversity of adaptation patterns to the environment in Indonesian society has become a guide in utilizing natural resources. For example, in managing natural disasters, the local wisdom of a community is the director in managing disaster management before, when, and after a disaster occurrence [2], such as the Tolaki community which has long provided education on avoiding natural disasters for generations. Norms regarding the field location, the right time to grow crops, and the procedures for clearing land have been passed down from generation to generation [3].

The government is trying to integrate local wisdom with education, one of which is physics education. Physics' characteristics are similar to local wisdom, relating to natural phenomena. The goal is to introduce culture to students to participate in maintaining their existence.

Recently, the local integration of wisdom with physics education was implemented at the school level. Research trends in integrating local potential are mainly implemented in various fields. Mapping the trend of this research can be done by conducting a literature review. However, in reality, systematic literature review research integrating local wisdom in new education focuses on biology, mathematics, astrophysics, and education in general, but it is not in physics education [4]. Studies on local wisdom that are intensively carried out in the education field attract us to visualize research trends involving local wisdom in physics education. Visualization of mapping of research trends was carried out using bibliometric studies.

Some of the research questions used in this study are (i) How is the distribution of the publications in the field of local wisdom? (ii) Which top countries often research local wisdom? (iii) What are the primary publications and research interests based on the author keywords in co-occurrence analysis?

2. Literature Review

Local wisdom is the origin of knowledge that comes from the thinking of a group of people. Local culture and lifestyle are inextricably linked to a sustainable economy, society, and environment. The specificity of an area's culture attracts interest and can improve people's quality of life [5].

Local wisdom closely attached to life is also used in the health and social fields. The lifestyle of the people in an area affects the quality of public health itself. It is not only in terms of lifestyle but also cultures in various regions. They have traditional methods believed to cure various diseases, including headaches, fever, asthma, wounds, stomach ulcers, and tumors, using plants or certain ways [6].

But, the various roles of local wisdom in social life are declining. People's awareness of local wisdom decreases as times change. The perspective on the environment has changed, resulting in various damages. For example, the Maluku Islands are natural disaster-prone areas with several unique traditional houses

formed based on local wisdom, climate, and topographical conditions since the 13th century. In the construction of residences, the Maluku people pay attention to environmental conditions to meet their needs, following the cultural context and natural conditions. They avoid various disasters or maintain the sustainability of the living environment [7].

3. Research Method

This study used bibliometric analysis to provide an overview of the field of research that papers, authors, and journals can be classified. The search for literature and metadata was carried out using the Scopus database, which began in June 2022 with the keyword "Local wisdom," and obtained 3.437 documents. The results obtained are screened so that the desired data is received. Screening is carried out by limiting the publication time of articles in the last five years (2018-2022). The type of documents chosen was articles with journal publications, so 438 articles were obtained. Documents obtained specifically in English were obtained as many as 428 documents. The search results of the paper are then exported in RIS format. The stages of this study are shown in Fig. 1. The next step is to analyze the data obtained using VOSviewer software to analyze co-authorship and co-occurrence. The units were analyzed on VOSviewer as a bibliometric analysis to visualize the network of authors, affiliates, countries, and keywords. Detailed information for the use of VOSviewer is shown in previous report [8].

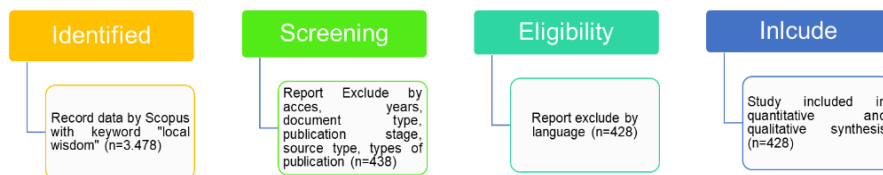


Fig 1. Step to select the document in this study.

4. Results and Discussion

Research conducted using bibliometric analysis aims to visualize information on published articles specifically on local wisdom. Bibliometric is one of the methods for analysing literature and has been used in many applications [8,9]. Based on the results obtained, research related to local wisdom in the last five years is presented in Fig. 2. The search results in the Scopus database on local wisdom published in Scopus-indexed journals have 428 articles in the last five years (2018-2022).

The curve shows that research related to local wisdom has increased yearly. However, in 2022, fewer articles will be published than in the previous year. The reason is that the article's publication in 2022 is still in the upgrade stage. As time goes by, publications in 2022 experience an increase, hoping to surpass publications in 2021. This growth illustrates that local wisdom is an interesting subject in research in education, health, and others.

The results of the influence country in the cultural diversity are presented in Fig. 3. Based on the analysis obtained by 47 countries that published the results of research on local wisdom. There are the ten most productive countries publishing local wisdom. Data shows that Indonesia has the most publications on local

wisdom, namely 218 documents. The increasing trend of research on local wisdom is influenced by the diversity of a nation and state.

Indonesia, which has a diversity of ethnicities, races, nations, religions, and cultures, is a factor that supports research on local wisdom in Indonesia [10]. Most of the research on local wisdom is widely found in education. Not only in education but also research on local wisdom is also found in health and disaster mitigation [11]. The results of network visualization of local wisdom based on co-occurrence analysis are found in Fig. 4. The results of the co-occurrence analysis with the keyword local wisdom are classified into six clusters.

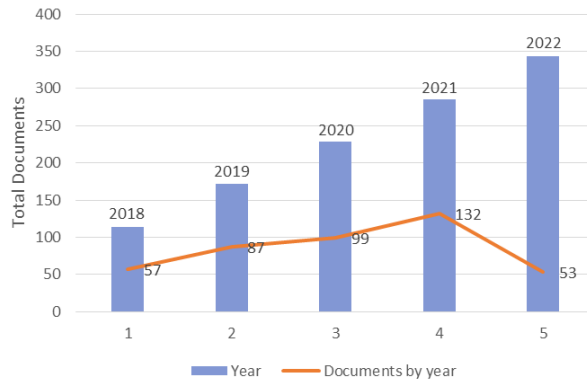


Fig 2. Documents by year about local wisdom.

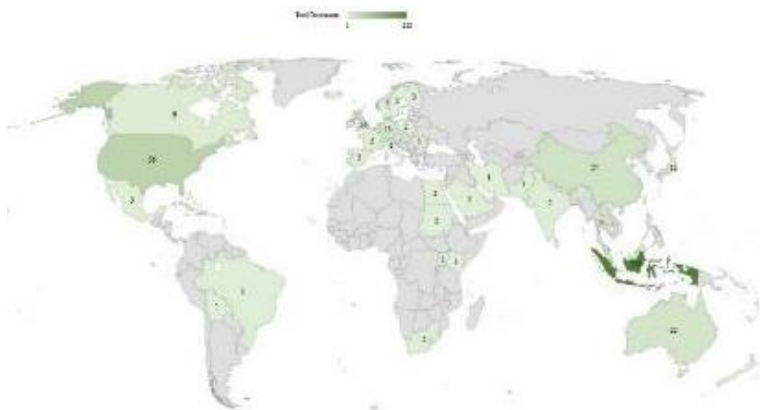


Fig 3. Countries that were publishing about local wisdom.

The first cluster (red) focused on local wisdom research. Humans are a definite research subject exploring local wisdom when viewed from keywords. The perspective is awakened from what is seen, felt, and lived every day continuously from the time children become adults. This behavior will affect human behavior and perspective when adults [12]. Each region has different customs. When humans are made subjects in research, it is to trace how the implementation of local wisdom in life can continue to be preserved its existence [13].

The second cluster (green) focused on sustainable development. Policies regarding the application of local wisdom depend on the government in a region. Indonesia and China are the countries with the largest population, having a great influence on the environment and nature [14]. The complex relationship between man and nature causes various problems if no governing policy exists. One problem is the extinction of living beings or cultures of the area [15].

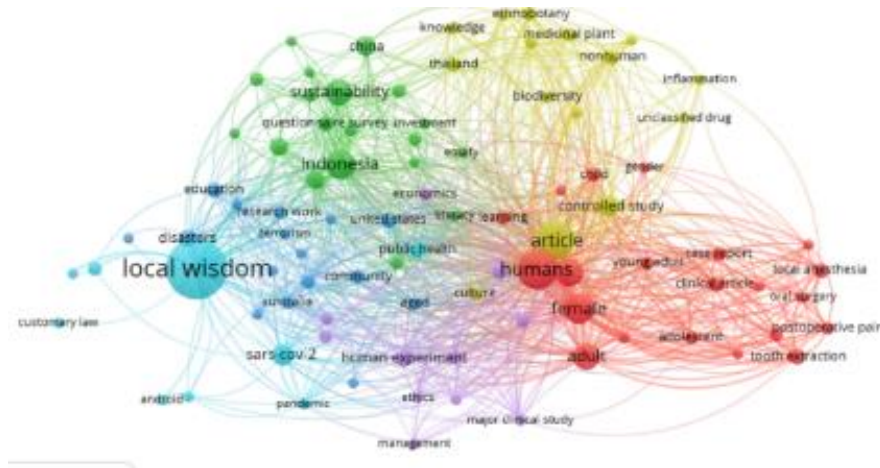


Fig 4. The results of the co-occurrence analysis.

The third cluster (dark blue) has the main highlight being disaster management through local wisdom. Local wisdom influenced by the geography of a region will form knowledge of disaster awareness [16]. People who understand the geographical conditions of the area where they live can recognize the signs of disasters and understand how to mitigate them. For example, in low-lying areas, people tend to build stilt houses in anticipation of flooding [17]. It shows that the community understands the form of disaster prevention and management [18]. The government can integrate local wisdom about disasters from the community into rule [19]. Community involvement is one of the keys to success in disaster management, especially considering the values embraced by the community, such as religious values and local wisdom [20]. Dissemination of knowledge about disaster management can be trained in the community through education. The application of disaster education is a form of preparation in the face of disaster [21].

The fourth cluster (yellow) focused on local wisdom in the health sector. Over the centuries, traditional healing of diseases using medicinal plants was something that many people did [22]. Medicinal plants are the embodiment of the wisdom of our ancestors. Different regions have special medicinal plants to treat the disease. Local wisdom research in the field of health has the potential to explore the types of traditional medicine further and increase scientific acceptance of them [23].

The fifth cluster (purple) gave rise to the main word focusing on human experiments. This main word describes various research methods of local wisdom in various fields. Local wisdom involving humans must have a certain ethical code to follow applicable procedures. The method in the study is used as a procedure for obtaining knowledge scientifically [24]. To acquire knowledge, you still must pay

attention to the applicable code of ethics. The code of conduct aims to obtain consent in excavating the desired information [25].

The sixth cluster (a light blue) focused on applying local wisdom in the world of education. Therefore, one form of Indonesian government policy is implementing the 2013 curriculum, which is integrated with local wisdom [26]. Integrating local wisdom in school learning embodies character education and improves literacy competence [27]. In addition to literacy, competencies also trained are problem-solving skills and representative abilities [28]. The integration of local wisdom developed in the form of android-based learning media is shown in Fig. 5. This happened because in 2020 the COVID-19 pandemic attacked, giving an impact on all aspects including education. Technology-based learning is implemented. Distance learning can be optimal. Learning media serves as a tool for students in understanding the material to be delivered [29]. The integration of local wisdom is manifested in books, e-modules, student worksheets, or learning media. Local wisdom is knowledge obtained from observations by previous people of the phenomena that occur. Some physical materials are temperature/heat, impulse/momentum, waves/sound, classification of matter and change, and work/energy [30-39].

This study also confirms the effectiveness of the use of bibliometric analysis. This is in line with previous studies for the effectiveness of bibliometric analysis [33-40] to explore and visualize the current literature that can be used for deciding whether further research be done.

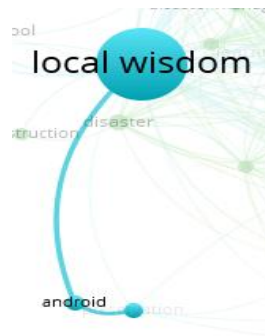


Fig 5. Network visualization integration local wisdom in technology.

5. Conclusion

The trend of local wisdom research varies in various fields, including educational, economic, environmental, and health. In the field of education, local wisdom is integrated with several physics materials and developed in the form of learning tools in the form of books, e-modules, student worksheets, or learning media. The increase in local wisdom research from 2018 to 2022 illustrates that cultural preservation needs to be done. It does not become extinct and can be felt by future generations. The integration of local wisdom in the field of education helps the government in the preservation of cultural wealth. The findings of this study can be used as a reference in further research on local wisdom for education, especially Physics education.

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