

Bibliometric Analysis: Trends Research on Local Wisdom in Science Learning and Its Implications for Strengthening Love Local Culture

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Abstract: Much research has been carried out on local wisdom at the junior high school level nationally, but research that has been published internationally and is Scopus indexed specifically discusses local wisdom at the junior high school level is still very minimal. The purpose of writing this research is as material to find out trends in local wisdom research in junior high school science learning. This study uses a bibliometric analysis method that uses sources from Scopus with publication limits from 2019 to 2023 on the Scopus database, and utilizes the VOSviewer application as a visualization tool. Data analysis through the Scopus database in this research was based on search results with local wisdom keywords written in the title words column and science learning as keywords. Found 45 publications in Scopus during 2019-2023 that discuss local wisdom in junior high schools. Published articles about local wisdom in junior high school science learning during 2019-2023 will be more researched in 2020 based on the results of data analysis through the Scopus database. The results of the bibliometric analysis research show that the trend of research on local wisdom at the junior high school level in the five year period (2019-2023) has focused more on the position of students as learning subjects and the development of research on local wisdom in junior high schools that specifically discusses the implications for strengthening the attitude of love for local culture for students have not been studied much.

Keywords: Junior High School Students; Local Wisdom; Love Local Culture; Science Learning

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INTRODUCTION

The uniqueness of Indonesia's culture and nature is scattered in various regions as regional potentials that can be developed in developing regions. Of course, each region has its own regional uniqueness, local wisdom, and culture. In the perspective of national education, the diversity of regional potentials is part of the considerations in planning educational policies. Students must be able to learn through their surroundings, for example, such as the local wisdom found in their respective regions (Khaerani et al., 2020; Khoiri et al., 2018; Wilujeng et al., 2017).

The national education system requires curriculum formulation based on local excellence or local wisdom, as stated in article 36 of Law no. 20 of 2003 concerning the National Education System. However, currently many young people do not know the local wisdom of their area (Ilhami et al., 2021; Jufrida et al., 2019). Some of them are more likely to choose to look for work outside their area. This is a problem for the world of education in Indonesia, where science education is still not integrated with the surrounding environment so it tends not to be able to recognize local wisdom.

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Local wisdom-based learning is very suitable to support the advancement of education (Jufrida, et al., 2020). Local wisdom-based learning, especially in science lessons, can facilitate students' understanding because students are able to see for themselves based on their environment. However, Kurniawati's research (2017) shows that the fact that is currently happening is that there is a decrease in students' interest in maximizing the local wisdom of their own region. In addition, students are also less interested in and less fond of local wisdom in their own area. So that the integration of local wisdom into science learning is very necessary to instill a culture of loving local wisdom. Integrating local wisdom into science learning will direct students to real learning in their surroundings.

Learning by utilizing the school environment and local wisdom as learning resources provides opportunities for students to learn through direct experience and the discovery of objects and phenomena that are appropriate to the learning material, and makes learning more interesting and fun (Lestari, 2018). In fact, the implementation of learning is still minimal in linking it with local wisdom (Fitriyah & Wardani, 2022). This is caused by several obstacles such as a lack of insight into local wisdom in their area, teachers do not understand how to integrate local wisdom into teaching materials, a large teacher teaching load, student books that are too textual, and adaptation of student learning, and inadequate facilities (Krissandi & Rusmawan, 2015).

Therefore, it is necessary to study more deeply the integration of local wisdom in science learning by analyzing the development of scientific publications on the topics of "local wisdom" and "learning science". This means that published journals that are related to the integration of local wisdom in science learning are studied and analyzed bibliometrically. This study uses journal objects from the Scopus database for 2019 - 2023.

During the period 2019 – 2023 research discussing local wisdom in science learning in the world has been reviewed in 2020. The data is known based on the existing database on Scopus and this data search utilizes the official Scopus website. Research data obtained through the Scopus database greatly facilitates researchers to find references for international research journal publications that are in accordance with the theme of local wisdom and science learning. The Scopus database also makes it easier for researchers to search for statistics-based journal publication data that have been conducted in the last five years. The term bibliometrics is often used for this research. Bibliometrics focuses more on the branch of library and information science which has quantitative characteristics through scientific activities carried out (Tupan, 2018). Bibliometric studies can be said to be a means of library science that helps researchers to obtain quality journals, articles, and books according to themes and a wide range of publications (Irianti, 2016).

Bibliometrics is a science related to writing and uses mathematical analysis which functions to determine the productivity of writers within a certain time span (Haryani & Sudin, 2020). Meanwhile, according to Nuryudi (2016), bibliometrics is a field of study that reveals the advantages and prowess of certain fields of knowledge, which can be analyzed from authorship, citation analysis, web-based bibliometrics, authorship collaboration, literature obsolescence and so on. on. Based on the above understanding, it can be concluded that bibliometrics is a science that examines authorship mathematically and writer's productivity as seen from the number of works written in a certain period of time.

Bibliometric analysis is applied to quantitatively measure and analyze certain indicators in published literature in certain domains and to generate knowledge maps based on large databases (Tupan, 2018). This allows researchers to summarize publication information regarding the distribution of papers by year, author, institution, journal, and discipline. Bibliometric analysis was used to obtain a research database by utilizing the official Scopus website while to visualize research developments using VOSviewer software. VOSviewer is a free computer program for visualizing and exploring bibliometric knowledge maps (Irianti, 2016). VOS stands for VOSviewer is Similarity Visualization.

Based on the description above, the authors are interested in researching "Bibliometric Analysis of Local Wisdom Research Tendencies in Middle School Science Learning and Its Implications for Strengthening Students' Loving Local Culture Attitudes" with the main issues in this research are: (1) What are the trends of research regarding the relationship of local wisdom in junior high school science learning?; (2) Can the topic about the relationship of local wisdom in junior high school science learning be used for further research?

The structure of this article includes several sections that discuss trends in local wisdom research in junior high school science learning based on the results of a bibliometric analysis of the last five years (2019-2023) and their implications for strengthening students' love for local culture. The attitude of love for local

culture is the behavior of students in thinking, behaving, and acting that shows high interest, loyalty, concern, and respect for local culture (Maharani & Dewi, 2015). It is hoped that the results of data analysis on local wisdom research trends in junior high school science learning can be used as a benchmark to find out how the attitude of loving local culture in science learning at the high school level can be improved.

METHOD

The research analysis used in this method is descriptive analysis that utilizes Scopus indexed article data sources. Descriptive analysis is a description process based on the data that has been collected (Haryani & Sudin, 2020). Scopus was chosen as the data source analysis material due to the wider scope of Scopus publications and it was stated that "Scopus as a source of high quality data and pushing the boundaries of quality forward, Scopus introduces an internal review process to continuously monitor predefined areas. quality focus, such as processing, profile quality, and completeness and accuracy of data sources." (Baas et al., 2020)

The method used in this study is a literature review with a bibliometric approach. Literature reviews should be carried out using systematic, explicit, and reproducible methods or mind mapping methods that emphasize knowledge boundaries (Caiado et al., 2018). Bibliometric analysis is an approach to examine the evolution of research domains, including topics and authors, based on the social, intellectual, and conceptual structure of a scientific discipline. Bibliometric analysis is commonly used within scientific disciplines and focuses on the quantitative study of journal papers, books, or other types of written communication (Heersmink et al., 2011).

The bibliometric analysis method in this study uses five stages. These five steps include defining the words "local wisdom" and "learning science" as the initial search keys (Defining Search Keywords), initial search results (Initial Search Result), refinement of the search results (Refinement of the Search Results), compiling statistics on the initial data (Compiling Statistics on the Initial Data), and data analysis (Data Analysis) (Fahimnia et al., 2015).

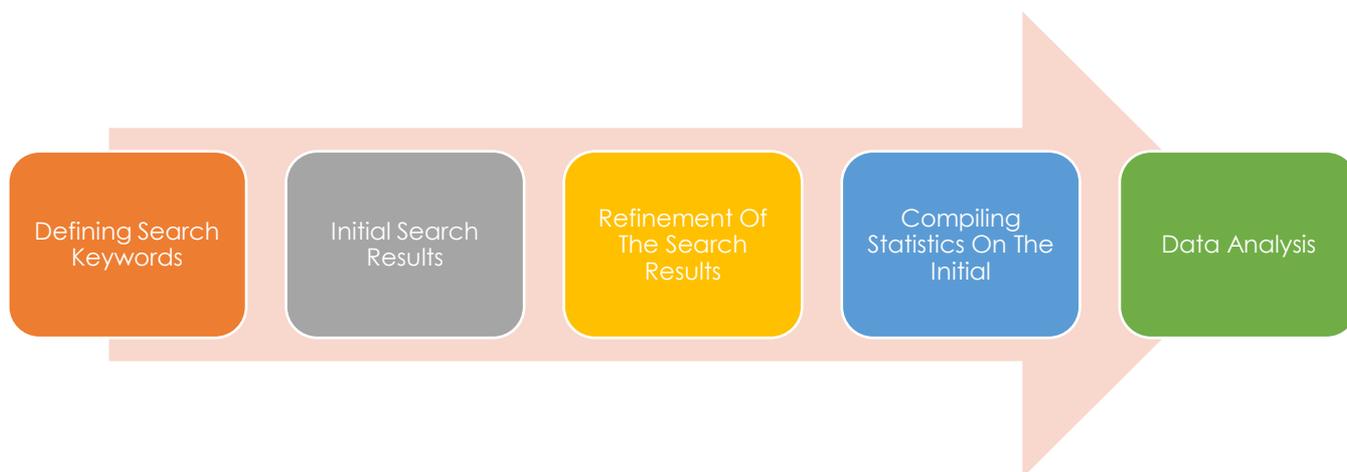


Figure 1. Bibliometric Analysis Workflow
(Source: Andhika Fitri et al., 2022)

Defining Search Keywords

This study uses journal objects from the Scopus database for 2019 - 2023. A literature search was conducted in February 2023, using the keywords "local wisdom" and "science learning". Scopus database is used to collect data. Initially, we entered queries into the Scopus scientific journal database, using the keywords "local wisdom", "science learning", and set specific conditions for "Article title", "Abstract" and "Keywords". The last database search was conducted on March 2, 2023. From the Scopus database, we obtained 114 articles in the initial search published during the period February 2019 – January 27, 2023.

Initial Search Results

Lists the top ten articles identified by Scopus (Unrefined Search) are shown in Table 1.

Table 1. Top 10 Articles Identified by Scopus (Unrefined Search)

Author	Title	Cited by
Susanto R.; Husen M.N.; Lajis A.	<i>The Effect of Portable Laboratory Integrated with Local Wisdom (PL-ILW) for Physics Learning</i>	0
Wauters V.M.; Hoidal N.	<i>Horizontalism and Wisdom Dialogues to Build Trust: A Case Study of Collaborations With Immigrant Farmers in Minnesota</i>	0
Balakrishnan V.	<i>Civics education in Malaysia: a clash between ethics, religion and cultural norms</i>	0
Andaria M.; Kusumah R.G.T.; Walid A.; Purdiyanto; Samsilayurni	<i>Feasibility Test Development of Science Process Skill Assessment in Public Junior High School 15 Bengkulu City</i>	0
Irhasyuarna Y.; Hafizah E.; Sari M.M.; Nurhaliza S.; Fajar I.N.	<i>The Development of Interactive Media in The Context of Wetland Local Wisdom on Science Materials for Junior High Schools to Practice Science Literacy</i>	0
Putu Verawati N.N.S.; Harjono A.; Wahyudi; Gummah S.	<i>Inquiry-Creative Learning Integrated with Ethnoscience: Efforts to Encourage Prospective Science Teachers' Critical Thinking in Indonesia</i>	0
Purnomo A.R.; Yulianto B.; Mahdiannur M.A.; Subekti H.	<i>Embedding Sustainable Development Goals to Support Curriculum Merdeka Using Projects in Biotechnology</i>	0
Muhammad U.A.; Fuad M.; Ariyani F.; Suyanto E.	<i>Bibliometric analysis of local wisdom-based learning: Direction for future history education research</i>	0
Wati I.K.; Nugraheni F.S.A.; Sari M.W.; Suciati; Widyastuti A.; Kamalialih K.	<i>Local Wisdom-Based Science Learning to Improve Creative Thinking: A Systematic Review</i>	0
Budiarti A.N.S.L.; Hernani	<i>Teaching Students to Live Sustainably Through Learning Videos of Traditional Rejang Fermented Food (Lemea)</i>	0

Refinement of The Search Results

We excluded articles that did not meet the screening criteria, Table 2 shows the results of this process. References from apparently important articles meet the requirements. Of the initial 114 articles, we withdrew 45 articles. After checking the title, abstract, and year of publication, 69 articles were excluded for various reasons. Table 3 shows a comparison of the metric data from initial search and fine search.

Table 2. Article Screening Results

Search Screening	Jumlah Artikel
Irrelevant (Not Educational Topic)	9
Not the topic of local wisdom in science learning	48
Unidentified/citation link only	0
Not a Journal	12
Local Wisdom Topic in Science Learning	45
Total	114

Table 3. Comparison Matrix

Data Matrix	Initial Search	Refinement Search
Keywords	<i>Local Wisdom, Science Learning</i>	<i>Local Wisdom, Science Learning, rentang tahun 2019 – 2023, Junior High School</i>
Source	Scopus	Scopus
Article	114	45
Citation	727	103
Cites each year	727	103
Cites each article	6.37	2.28
Author each article	3.75	3.46

Compiling Statistics on The Initial

The search data generated after the fix is then downloaded, stored in the Mendeley application and exported to RIS format to include all important information related to authors, authors (ID), title, year, source

title, volume, issue, page start, page end, page count, cited by, DOI, affiliations, abstract, author keywords, and index keywords.

Data Analysis

Presenting bibliometric analysis for the keywords "local wisdom" and "science learning" to then narrow the search to 2019 - 2023 and to the "junior high school" level from the Scopus database. The bibliometric analysis in this article used the Scopus database and obtained 114 articles from the initial search results with 727 citations (727 citations/year). Refinement of search results based on predefined categories leaving 45 articles. Data regarding citations also underwent changes, namely to 103 citations and 103 citations/year. The complete results of the comparison of the matrix before and after the search narrowing are summarized in Table 3.

RESULT AND DISCUSSION

Results of Bibliometric Analysis of Local Wisdom Research Trends in Middle School Science Learning

The results of trend analysis and development of publications from 2019-2023 contained fluctuating data, the most searches for publications about local wisdom in science learning were in 2020, namely 122 articles, while the least data was in 2017. The research findings show that the article written by Ilhami A., Riandi R., and Sriyati S. with the title Implementation of Science Learning with Local Wisdom Approach Toward Environmental Literacy published by the Journal of Physics is the most cited article with a total of 13 citations in the trend of local wisdom panel research in junior high school science learning. The second most cited article is the article belonging to Sumarmi, Bachri S., Baidowi A., and Aliman M. with the title Problem-Based Service Learning's Effect on Environmental Concern and Ability to Write Scientific Papers published by the International Journal of Instruction with a total 10 quotes.

After accounting for citation frequency and other metrics, we analyze the output from the Scopus database into the VOSviewer application to determine what keywords appear most frequently. The VOSviewer application is used to visualize bibliometric maps in three different visualizations, namely network visualization, overlay visualization, and density visualization. Figure 1 shows a visualization of publications, where publications about local wisdom are more dominant. And you can see the link between each keyword in science learning. Furthermore, the theme of local wisdom is narrowed down to 20 themes, some of which are shown in Figure 2.

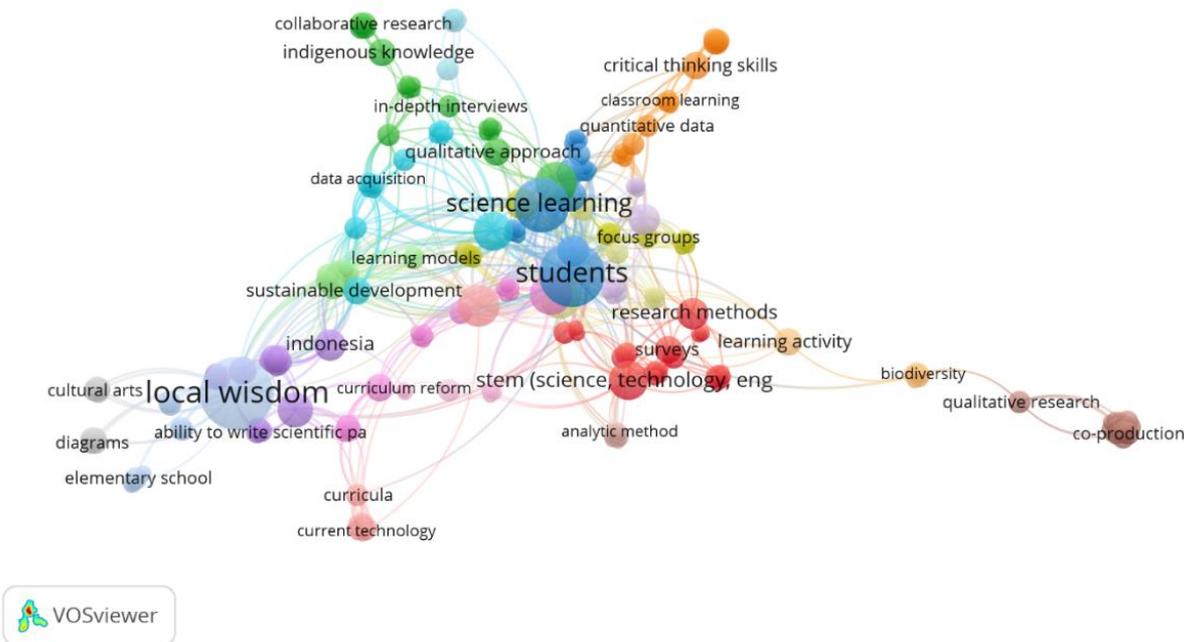


Figure 1. Visualization of research trend maps

Selected	Keyword	Occurrences	Total link strength
<input checked="" type="checkbox"/>	students	17	55
<input checked="" type="checkbox"/>	science learning	12	40
<input checked="" type="checkbox"/>	learning systems	7	29
<input checked="" type="checkbox"/>	learning process	7	27
<input checked="" type="checkbox"/>	education computing	6	26
<input checked="" type="checkbox"/>	junior high schools	6	25
<input checked="" type="checkbox"/>	data collection	4	20
<input checked="" type="checkbox"/>	physics	7	17
<input checked="" type="checkbox"/>	teaching materials	4	17
<input checked="" type="checkbox"/>	local wisdom	12	15
<input checked="" type="checkbox"/>	elementary schools	4	14
<input checked="" type="checkbox"/>	stem (science, technology, engineering and mathe...	6	14
<input checked="" type="checkbox"/>	data analysis techniques	3	13
<input checked="" type="checkbox"/>	learning models	2	12
<input checked="" type="checkbox"/>	research methods	4	11
<input checked="" type="checkbox"/>	surveys	3	9
<input checked="" type="checkbox"/>	environmental technology	2	8
<input checked="" type="checkbox"/>	indonesia	3	8
<input checked="" type="checkbox"/>	qualitative approach	3	8
<input checked="" type="checkbox"/>	sustainable development	3	6

Figure 2. Selected Theme Using VOSviewer

Based on the theme chosen above, the visualization of research and publications about local wisdom in science learning for junior high schools can be seen more specifically in Figure 3.

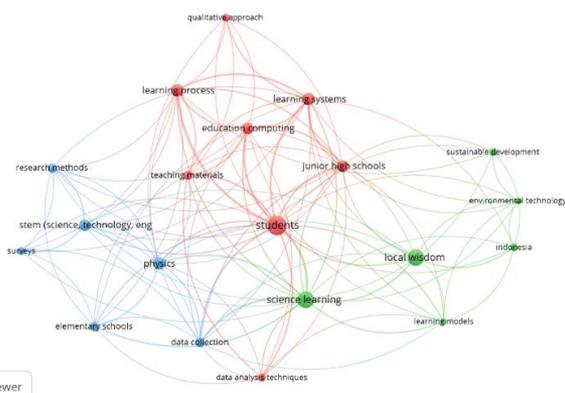


Figure 3. Visualization of Selected Themes about Local Wisdom Using VOSviewer

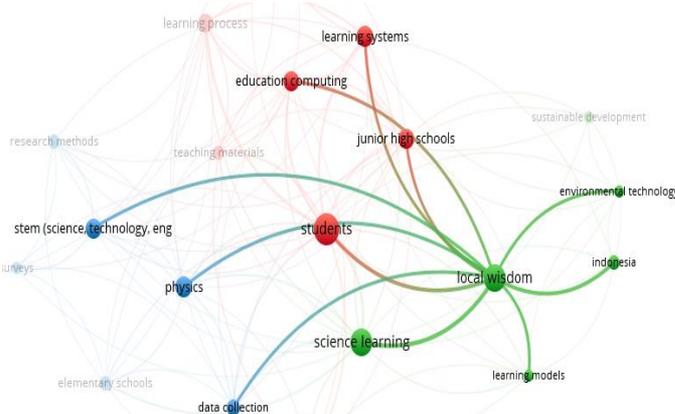


Figure 4. Visualization of Selected Themes on Local Wisdom

Figure 3 shows an opportunity to carry out further research on local wisdom that can be linked to science learning, learning models, environmental technology, computational education, STEM approaches, physics learning, and integration of science learning with local wisdom in junior high schools. Broader research on local wisdom can be applied in various countries including Indonesia.

Network visualization data shows that Scopus published research conducted during 2019-2022 discusses local wisdom in junior high school science learning from the aspect of students as learning subjects. This is evidenced by the presence of a red dot symbol which is the center and is larger in size in Figure 3. VOSviewer processed data in this research shows that there are 3 clusters.

Cluster is a multivariate technique whose main goal is to group objects based on their characteristics (Elisawati et al., 2019). In this research, there are 3 clusters that are in accordance with the discussion of local wisdom in junior high school science learning, which can be seen in Table 4.

Tabel 4. Cluster "Local Wisdom" di Data Scopus

Cluster 1	Cluster 2	Cluster 3
Data analysis techniques	Environmental technology	Data collection
Education computing	Indonesia	Elementary schools
Junior high schools	Learning models	Physics
Learning process	Local wisdom	Research methods
Learning systems	Science learning	Stem (science, technology, engineering, and mathematics)
Qualitative approach	Sustainable development	surveys
Student		
Teaching materials		

The three clusters above show that there is a connection between research conducted over a period of five years (2019-2023). The interconnected cluster data can make it easier for researchers to find the latest and oldest research themes related to the discussion of local wisdom in science learning in junior high schools which have been published by Scopus.

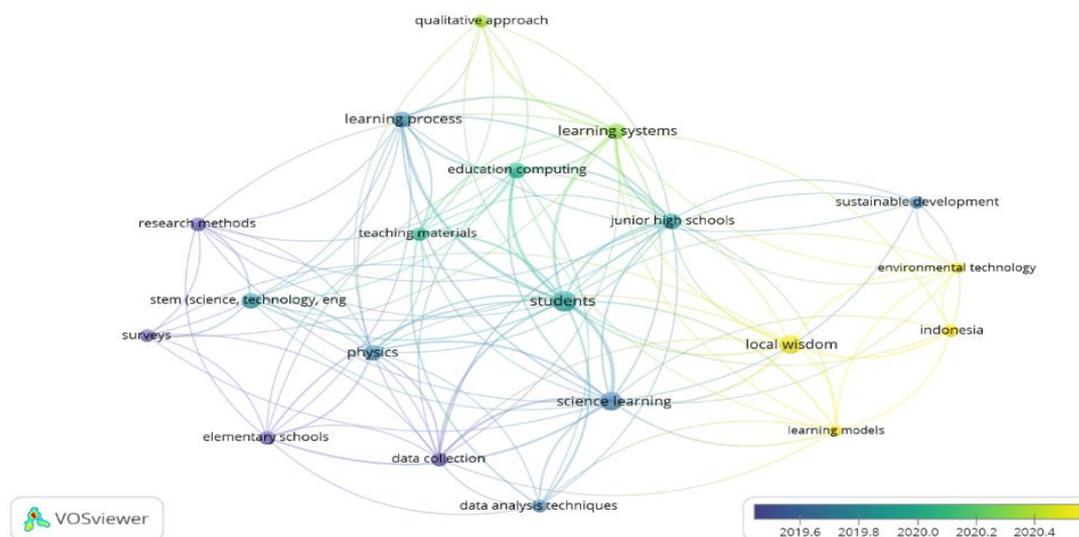


Figure 5. Overlay Visualization of the Last 5 Years (2019-2023) Search of Local Wisdom as a Whole in Scopus Data

The color shown in the VOSviewer application overlay visualization represents research for 2019-2023 with the latest research symbolized in yellow and the oldest research in purple. The brighter the color shown in the overlay visualization, it means that the data is the latest research result that has been published by Scopus. Whereas the darker the color shown, the research is included in the publication category for the maximum year limit for the search carried out. Based on the overlay visualization data for the last five years (2019-2023) it is known that the latest research published and Scopus indexed is local wisdom, environmental technology, and learning models published around 2020. This Overlay Visualization is used to find out research on limited and increasing topics in nearest time.

Bibliometric analysis for the period 2019-2023 research discussing local wisdom in science learning in junior high schools from all over the world and indexed Scopus was more dominant published in 2020 and there was no Scopus published research discussing local wisdom in science learning in junior high schools in 2023. This is evidenced by the density visualization data which shows that the discussion in 2020 about local wisdom is clearer than other studies.

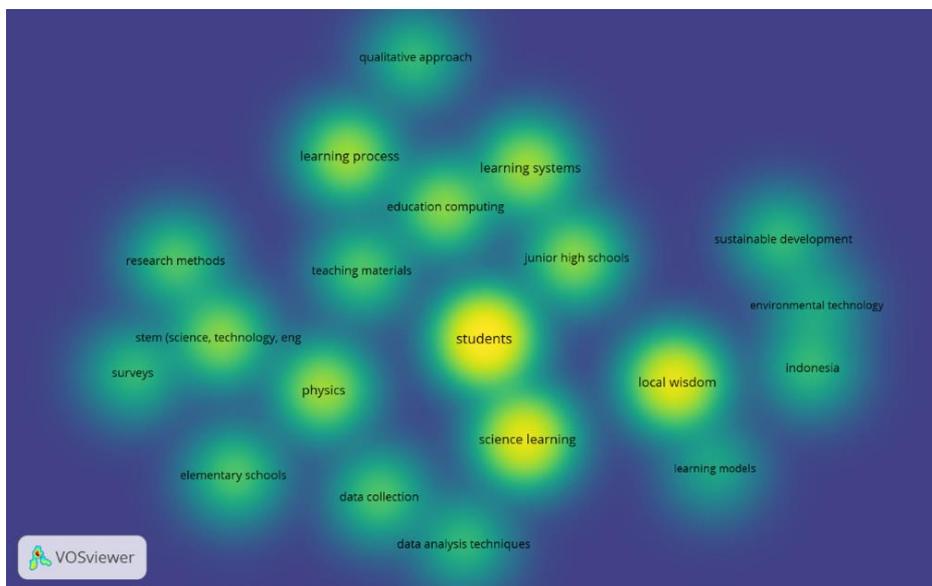


Figure 6. Density Visualization of Local Wisdom in Scopus Data

Figure 6 shows that the research theme with the search for local wisdom data in junior high school science learning which is often discussed has a more intense yellow color. Based on the results of this research, more research has been conducted to discuss local wisdom in junior high school science learning, namely students, science learning, learning processes, and learning systems.

Implications of Research Trends for Strengthening Students' Love for Local Culture

One of the characters that can be developed in the lesson is the character of love for local culture in students. Knowledge that is related to everyday life and there are phenomena that exist in the environment, science can be integrated into character education (Maharani & Dewi, 2015). Therefore, learning will be more meaningful if there is a connection between learning and the improvement or success of students which is marked by an increase in better student character.

According to the Big Indonesian Dictionary, culture is thought, reason, customs (Depdiknas, 2008). Meanwhile, culture is the result of the activities and creation of the human mind, such as beliefs, arts and customs. Local culture is a characteristic of the culture of a local community group. Meanwhile, love for local culture is a way of thinking, behaving, and acting that shows loyalty, caring, and high appreciation for culture (Cahyaningrum & Sukestiyarno, 2016). The character of loving local culture is a national character that needs to be developed in students.

Learning to increase students' appreciation of culture emphasizes meaningful learning. Meaningful learning that is learned has high potential to be utilized in life, both personal life and participation in social life (Cahyaningrum & Sukestiyarno, 2016). Culture is an aspect that has begun to disappear, even though culture is an important aspect for knowing the identity of an individual or society. Advances in technology, communication, information and transportation have led to the rapid entry of foreign cultural influences into Indonesia.

In this globalization era, it has a negative influence on local culture in Indonesia. Globalization has a negative impact on national culture. Signs of love for local culture such as interest, loyalty, caring, and high respect for culture must be increased because culture is an important aspect (Siany & Catur, 2009). Each region has a different culture so that each region has a distinctive identity and characteristics. Local cultural values need to be preserved because local culture is characteristic of a local community group.

The attitude of love for local culture is very important to be instilled in the minds of students. Learning will be more meaningful if there is a connection between learning and the improvement or success of students which is marked by an increase in better student character. Indicators of love for local culture are interest, loyalty, concern, respect for local culture (Cahyaningrum & Sukestiyarno, 2016).

Improving students' love for local culture is inseparable from the teacher's ability to implement learning that provides more experience for students during the learning process so that students' love for local culture can develop. Integrating local wisdom into science learning is very necessary to instill a culture of

loving local wisdom (Kurniawati, 2017). Integrating local wisdom into science learning will direct students to real learning in the surrounding environment.

Education can be developed by relying on the uniqueness and superiority of an area, including local (traditional) culture and technology (Nuralita, 2020). Learning that implements local cultural traditions is able to deliver students to love their region and nation. Students can gain direct knowledge from local cultural practitioners.

Implementation of local wisdom-based learning needs to pay attention to the selection of learning resources (Nuralita, 2020). Several effective learning resources are used in science learning, including the surrounding environment, literature, audio-visual, and the internet. Teachers can create a learning resource in the form of media, such as videos, modules, and others to facilitate the implementation of learning. In addition, teachers can take advantage of various literature and the internet to assist the learning process.

The choice of local wisdom in science subjects as the main theme is because this theme is closely related to everyday life and can instill character values in students. In addition, the implementation of the right learning model will certainly affect the improvement of the quality of learning in schools. In implementing local wisdom-based learning, it is obtained through learner-centered learning methods, namely through exploration and discovery activities (Wahyu, 2017).

It is necessary to have the role of various parties so that the implementation of strengthening the attitude of loving local culture for junior high school students can be carried out properly and accordingly. One of them is through local wisdom research conducted by researchers to find out how developments and innovations can be done to strengthen the attitude of love for local culture at the high school level in accordance with the times.

CONCLUSION

Based on the results of the analysis and discussion, research on local wisdom research trends within five years (2019-2023) based on the Scopus database has three clusters and is more dominant in research that discusses students as learning subjects. Bibliometric data shows that in 2023 there will be no Scopus indexed publications discussing local wisdom at the junior high school level. This can be a great opportunity for future researchers to conduct research based on local wisdom in the realm of junior high school education. The implications of research trends in strengthening the attitude of love for local culture for junior high school students can be seen from the existence of various problems in the surrounding environment related to the attitude of love for local culture of junior high school students which is used as a topic of discussion in research by linking various appropriate references.

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