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Analisys Bibliometric of Science Local Wisdom with Vosviewer Application during 40 years

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ABSTRACT

Objective: *This study aims to analyze the development and trends in research publications related to science in the context of local wisdom, also known as science local wisdom. Local wisdom can be understood as human efforts to act and behave toward certain phenomena, objects, or events based on cognitive and cultural frameworks. Unconsciously, many forms of local wisdom inherently contain scientific elements. The objective of this research is to map and examine the academic discourse surrounding this topic through a bibliometric lens using Scopus-indexed publications.* ***Method:*** *The study employed a bibliometric analysis approach to explore the evolution of scientific research concerning local wisdom. This method quantitatively analyzes published literature—including journal articles, books, and other forms of written communication—based on their social, intellectual, and conceptual structures. Data were retrieved from the Scopus database and analyzed using bibliometric software tools to visualize patterns of publication, identify keyword trends, track prolific authors, and examine research collaborations.* ***Results:*** *The results indicate that the topic of science local wisdom is still emerging and has been receiving growing scholarly attention in recent years. The distribution of keywords and publication trends indicates that the integration of local wisdom into science education, particularly in physics learning, is becoming a growing area of research interest. However, the number of publications remains relatively low, suggesting a significant opportunity for future exploration.* ***Novelty:*** *This study highlights the novelty of connecting scientific literacy and education with local cultural knowledge systems. By providing a comprehensive bibliometric overview, the study not only identifies current research gaps but also emphasizes the potential of local wisdom as a culturally responsive approach to science learning, particularly within physics education. This integrated perspective offers a fresh direction for interdisciplinary educational research.*

INTRODUCTION

Local wisdom can be understood as a human effort to use their mind (cognition) to act and behave towards something, an object or a specific event in space. Wisdom is understood as a person's ability to use his mind in acting or behaving because of the assessment of something, an object, or an event that occurs. Wisdom is often interpreted as 'wisdom', decisions and actions, including the act of reflecting, are closely linked to wisdom (Ridwan, 2007; Rafael et al., 2019). According to Satriawan (2016), local wisdom is a set of knowledge, values, behavior, and ways of behaving towards particular objects and events in his environment that are recognized as reasonable and proper. Local wisdom cannot be separated from our lives, especially for the Indonesian people. Indonesia, as a country with diverse cultures and arts, makes its society inseparable from local wisdom in every aspect.

Local wisdom, without us realizing it, often contains elements of science within it. Local wisdom can be used as a context in science learning. Local wisdom is a very productive context for learning Science that is very familiar to students (Erman &

Suyatno, 2022). According to Sudarmin (2014), Science is knowledge obtained by using specific methods and following a systematic sequence to obtain it. In the process of obtaining Science (knowledge), it is necessary to have trials to test the truth of the Science. From science and local wisdom, Ethnoscience will emerge, namely a set of scientific knowledge owned by a society that is obtained using certain methods and following specific procedures, which are part of a tradition. Its truth can be tested empirically (Sudarmin, 2014).

Local wisdom cannot necessarily be considered an implementation of science (Ethnoscience) because the knowledge possessed by the community is essentially divided into two categories: indigenous knowledge and indigenous science. Indigenous knowledge refers to the collective knowledge of a community about an object, phenomenon, or even knowledge that is passed down from one generation to the next over hundreds of years (Erman & Suyatno, 2022). This knowledge tends to be local and is maintained by a particular community or tribe. Indigenous knowledge encompasses a broad range of aspects of social life, including health, environment, natural resource management, agriculture, fisheries, economy, politic, gender and biodiversity conservation (Sinkerveer et al., 2019; Mahrinasari et al., 2024; Dewa et al., 2024; Robert et al., 2024; Syahria et al., 2024; Issa et al., 2025). Indigenous knowledge itself significantly represents the socio-economic life of a particular community or tribe.

In today's era, local wisdom has begun to be incorporated into learning. This is done because local wisdom is considered more relatable to students, making it easier for them to understand the lessons explained by the teacher. According to Shufa (2018), many teachers have not integrated local wisdom into their teaching, resulting in educational goals not being achieved, as well as a lack of understanding of local wisdom in their environment. Wagiran (2011) also researched the development of local wisdom-based learning models; his research found that wisdom-based education needs to be implemented. The primary reason for implementing local wisdom-based learning is to increase student's familiarity with the culture and local wisdom prevalent in Indonesia, particularly in their respective regions. The statement about the importance of local wisdom-based learning aligns with the purpose of education as an effort to preserve and inherit culture. This statement is supported by Daryanto (2014, p. 1), who asserts that education serves as a means to introduce and cultivate the noble values of culture in students, enabling them to become proud inheritors and contributors to the nation's cultural development.

Based on the explanation above, the author will conduct research on the distribution of research related to local wisdom science using bibliometric analysis aided by the VOSviewer application. VOSviewer is a scientometric and bibliometric software that is frequently used for such research initiatives. It is a powerful tool for data analysis and display (Sasvári et al., 2025). Bibliometrics is a science related to writing that uses mathematical analysis to determine the productivity of writers over a specific period (Haryana & Sudin, 2020). Meanwhile, according to Nuryudi (2016), bibliometrics is a field of study that reveals the advantages and greatness of a particular field of science, which can be analyzed through writing, citation analysis, web-based bibliometrics, writing collaboration, and literature obsolescence, among others. Based on the understanding above, bibliometrics is a science that studies writing mathematically and the productivity of writers, as measured by the number of works written within a specific period.

This article aims to provide a bibliometric analysis of the literature related to research on local wisdom science, focusing on research trends and publications indexed in the Scopus database. This analysis can reveal the topic areas that are the subject of most publications and research opportunities for scientific literacy in education, especially in the field of physics.

RESEARCH METHOD

This research was conducted through a literature study using a bibliometric analysis method. Bibliometric analysis is based on research that reveals the development of literature, including the number of publications, articles, research approaches, and author productivity. This bibliometric analysis was conducted to provide a broader understanding of all disciplines and see the visualization of publication trend mapping and article contributions to the development of science (Ates et al., 2025; Guo et al., 2019; Huynh et al., 2025; Karakus et al., 2019; Pan et al., 2025; Yulianingsih et al., 2020)

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

Figure 1 shows the data analysis process using the bibliometric analysis method. The first step is to determine relevant keywords, such as "(Local Wisdom Science)," and 358 articles were identified as sources of data for this study as a result of the initial search and research refinement. Furthermore, the data was downloaded. The data obtained was then further processed using Microsoft Excel and VOSViewer to create a bibliometric map as part of the data analysis process.

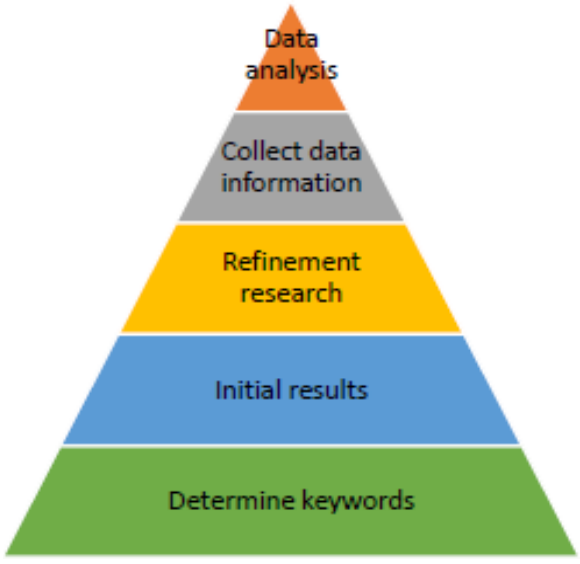

Figure 1. Five steps in performing a bibliometric analysis (Dawana et al., 2022)

RESULTS AND DISCUSSION

Results

In this section, we will discuss the distribution of articles on the topic of science local wisdom in Scopus without specifying a specific period. This study presents the distribution of topics discussed in all articles with the theme of science and local wisdom, as well as the distribution of authors who discuss these topics. Based on the metadata obtained from Scopus, it is known that research on this topic was conducted in 1983 by Hackler J. with the research title "Interpreting Meaning in Juvenile Court: The Use of Local Wisdom." The distribution of Articles Published in the last five years was also obtained following the general standard pulishers (American Psychological Association, 2021; nXr, 2022).

Table 1. Distribution of articles published in the last 5 years

Year	Number of Articles
2018	24
2019	78
2020	44
2021	64
2022	26

Based on the analysis carried out using the Vosviewer application, the following visualization was obtained.

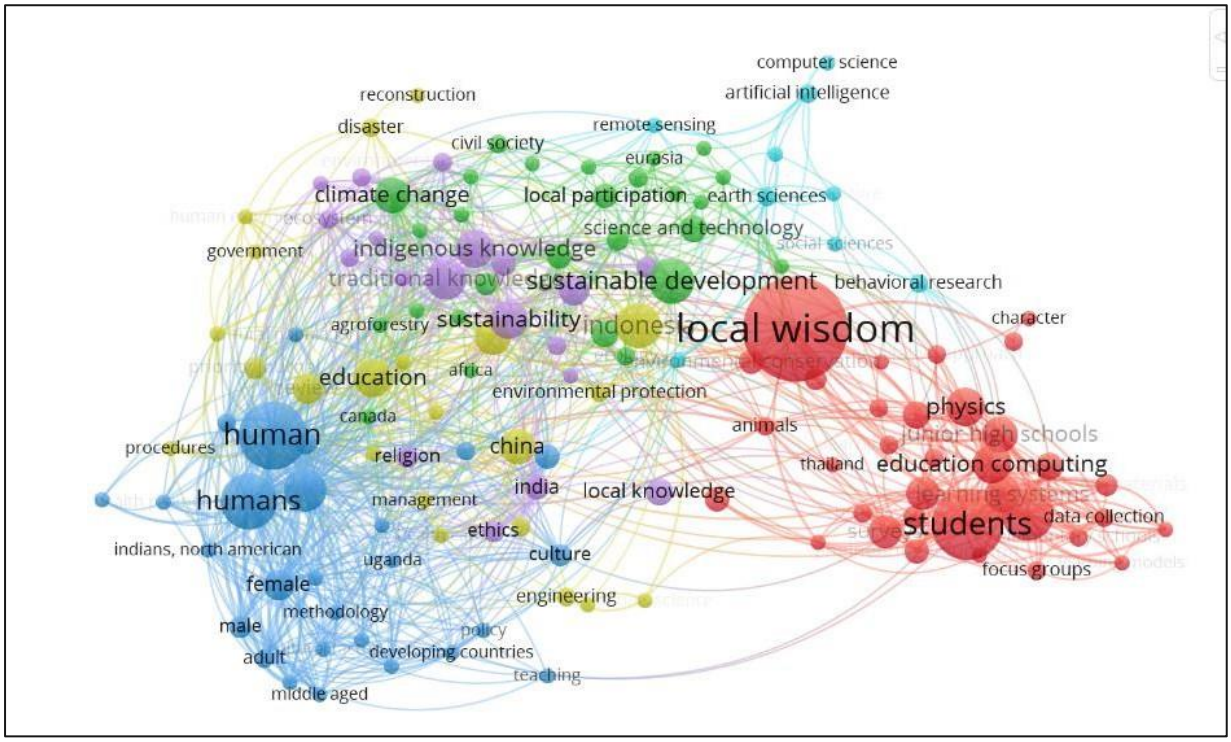

Figure 2. Visualization of research trend maps

From Figure 2, we can see that several topics dominate the collection of articles with the theme of "science local wisdom," namely local wisdom, students, humans, sustainable development, and education.

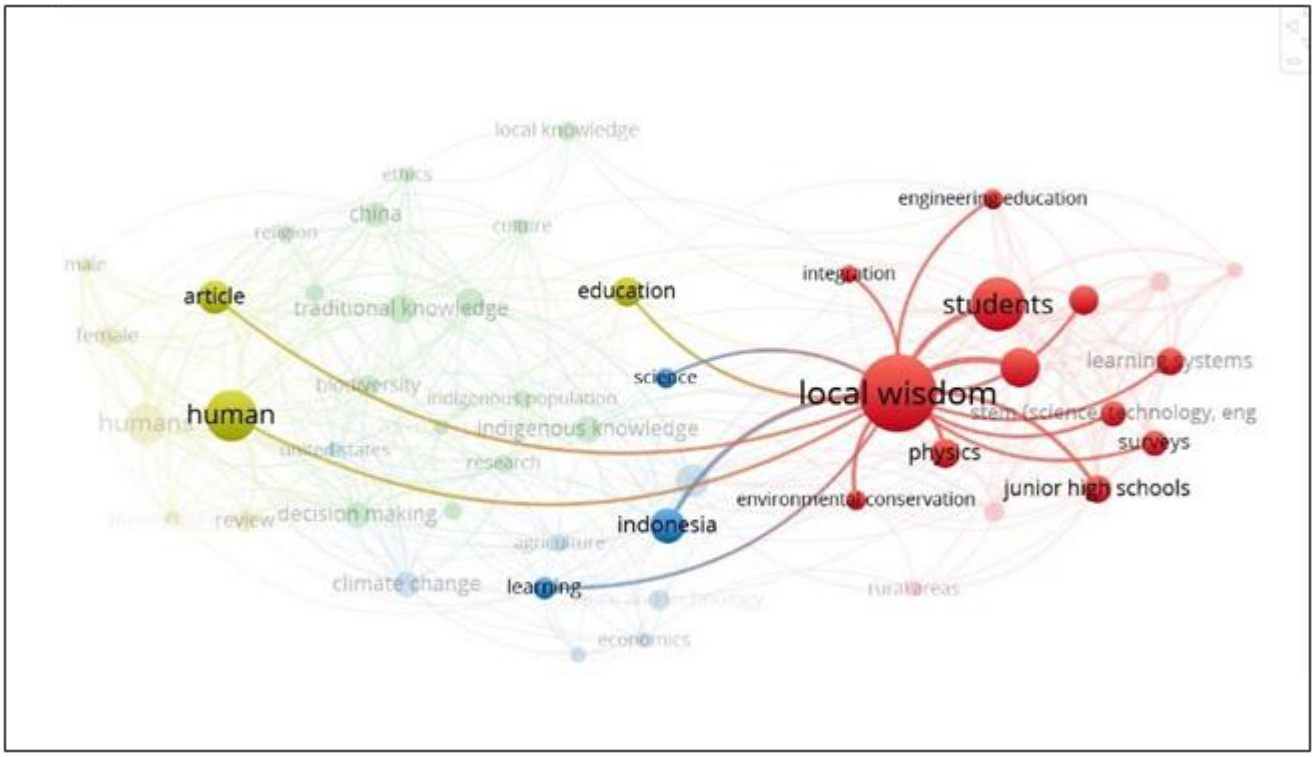

Figure 3. Trend network visualization on the topic of local wisdom

Based on the trend of local wisdom topics, local wisdom is related to education, science, physics, junior high schools, students, and humanity. This suggests that local wisdom can be applied and utilized in learning, although the trend is still not widespread, as indicated by Figure 3. Then, it is seen from the physical side in Figure 4.

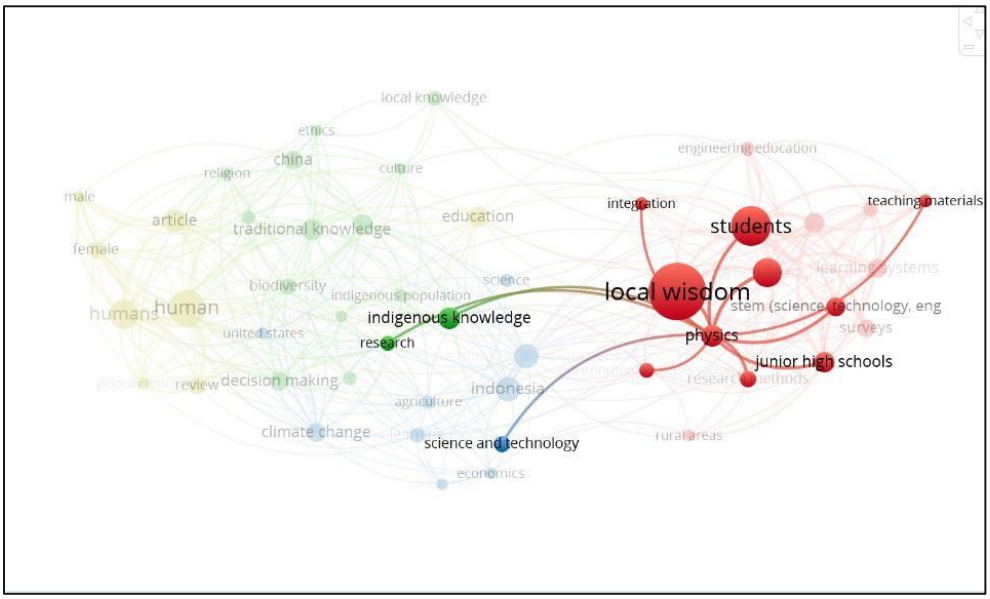

Figure 4. Trend network visualization on physics topic

From the visualization above, it can be observed that physics topics related to local wisdom are still relatively under-studied and researched in the context of "science local wisdom."

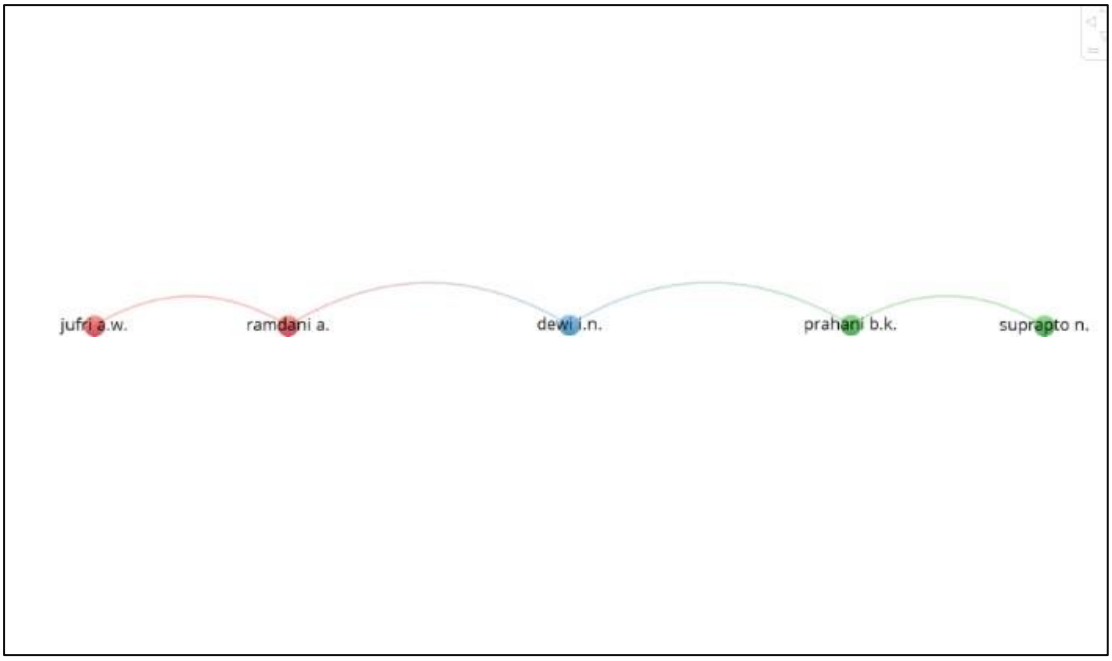

Figure 5. Author visualization with a minimum two documents

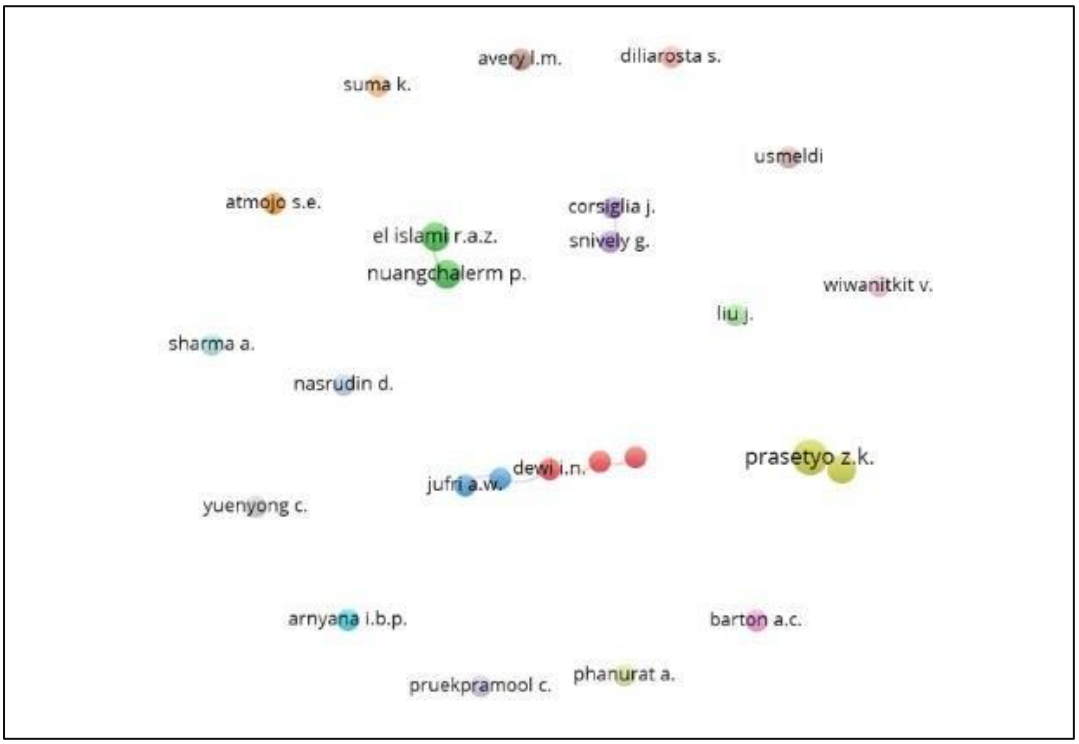

Figure 6. Author visualization with one document

From the visualizations in Figures 5 and 6, it can be stated that almost all authors who raise the topic of "science local wisdom" are from Indonesia. This is because Indonesia is a country with a very diverse local wisdom, comprising many islands, tribes, and cultures.

Discussion

According to the data above, the first time this research was conducted was in 1983. There was no further research on this topic until 1986. In the 2000s, numerous studies

began to be conducted on the topic of local science wisdom. This indicates that in the millennial era, many researchers are becoming increasingly interested in research on the topic of local science wisdom. In research conducted over the last five years, from 2018 to 2022, 236 articles were published in Scopus, representing a subset of all articles published from 1983 to 2023, which totaled 359 articles. This indicates a significant increase in interest in researching the topic of local science wisdom over the last five years. The most research was conducted in 2019, with a total of 78 articles published in Scopus. This occurred because, in 2019, research began to be intensively carried out on local wisdom associated with science.

Based on the existing data, the topic of local wisdom science is still a relatively new area of study and has not been extensively researched by researchers outside Indonesia. This topic is widely studied in Indonesia because researchers have observed a correlation between cultural diversity and local wisdom, as supported by existing scientific evidence. The science that exists in society, which was initially considered a myth and superstition, is fascinating for researchers to study and explore. It was found that several local wisdoms are considered myths. However, after research, it was found that from a scientific perspective, it can be explained, for example, the use of guava leaves as a medicine for diarrhea; in the past, this medicine was considered a traditional medicine in society, but after being studied, guava leaves do have properties to treat diarrhea. This is what is called reconstructing community science into original science. There are many more examples of local wisdom that are integrated with science. A part from Indonesia, several countries have begun researching this topic, including China and India; however, the number of studies is not as extensive as in Indonesia. China and India are countries with rich cultural diversity, which also makes it possible to research the topic of local wisdom science.

Local wisdom science has a deeper sub-discussion, one of which is local physics wisdom. There are many local wisdoms, expressed in the form of games, dances, traditions, and cultures, as well as natural resources, that we often overlook. However, upon closer examination, we realize that their implementation involves physics concepts. Local wisdom that we often overlook contains physics concepts, one of which is the concept of fire heaven in Bojonegoro. According to Lestari (2022), the local wisdom of fire heaven incorporates physics concepts in the form of magnetic and electric fields. The magnetic field in the Earth affects the eternal fire at the natural site of fire heaven. In addition to local wisdom in the form of natural resources, there is also local wisdom embodied in games, dances, and cultural objects that incorporate physics concepts. One of them is the local wisdom about bedbugs in Purworejo, as noted by Amrul (2019). When the bug is hit, the air inside it vibrates, a phenomenon known as resonance. This principle is used to strengthen its sound. This resonance concept has been unknowingly carried out by Beduk artisans since ancient times, demonstrating that local wisdom can be integrated with science and vice versa, as science can be integrated into local wisdom. Local science wisdom has begun to be developed and implemented in learning, one of which is physics education.

Currently, education tends to employ a learning system that only transfers knowledge to students and is textbook-based, resulting in knowledge gained during learning not being integrated with the existing culture (Febriyanti, 2017). Therefore, there needs to be learning that makes students feel involved in the process. Of course, the knowledge they gain must be integrated with the existing culture. Consequently, education must be integrated with local wisdom so that students can understand it

more easily, especially in physics learning. Culturally valuable science learning can provide meaning to people's lives if a teacher can equip students with the skills to design and develop an effective learning system and create an engaging atmosphere (Rahmati et al., 2022). The local wisdom-based learning model is carried out by reconstructing local wisdom (the native science of the community). The intended reconstruction is the rearrangement or translation of original science into Western science concepts or scientific science. This original science is derived from the observation of cultures within society (Khusniati, 2017). Through this reconstruction, the application of scientific concepts can facilitate mastery of these concepts, especially the concept of physics.

The integration of local wisdom into learning can be achieved in several ways, including the incorporation of local wisdom into teaching materials, teaching modules, learning models, and project assignments. According to Rosadi (2019), the application of science teaching materials based on local cultural wisdom can improve student learning achievement and physics learning activities in students. According to Satriawan (2016), context-based teaching materials that integrate traditional wisdom, when developed, are very suitable for use and can improve students' mastery of physics concepts in physics lectures. From the data presentation above, it is evident that local wisdom is integrated with education and students, indicating that many studies focus on learning based on local wisdom.

CONCLUSION

Fundamental Finding: The integration of local wisdom into physics learning, whether through teaching materials, modules, models, or project-based assignments, has been shown to enhance student engagement and conceptual mastery significantly. As demonstrated by Rosadi (2019) and Satriawan (2016), embedding local cultural contexts within science education fosters more meaningful learning experiences and improves students' understanding and performance in physics. **Implication:** This finding emphasizes the importance of designing learning resources and strategies that are culturally relevant. Integrating local wisdom not only makes physics education more relatable but also contributes to the preservation of cultural values, aligning with the goals of contextual and sustainable education. Educators should consider local contexts as valuable pedagogical tools that can bridge the gap between scientific concepts and students' real-world experiences. **Limitation:** Despite promising outcomes, the current body of research remains limited in scope, often focusing on specific regions or particular cultural practices. There is a lack of longitudinal studies that explore the sustained impact of integrating local wisdom over time, as well as studies that examine its effectiveness across different educational levels and diverse cultural backgrounds. **Future Research:** Further studies should investigate the development and implementation of locally grounded physics learning tools in diverse cultural contexts. Comparative research involving multiple regions could provide a broader understanding of best practices in integrating local wisdom. Additionally, future research should investigate the long-term effects of such integration on students' scientific literacy, critical thinking, and cultural identity.

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REFERENCES

American Psychological Association. (n.d.). The "outdated sources" myth. APA Style. https://apastyle.apa.org/blog/outdated-sources-myth

Amrul, F., Tantri M., & Kurniadi, E. (2019). Pengembangan modul fisika STEM terintegrasi kearifan lokal "Beduk" untuk meningkatkan kemampuan berpikir kreatif siswa SMP. *Berkala Ilmu Pendidikan Fisika, 7*(1). https://ppjp.ulm.ac.id/journal/index.php/bipf

Ateş, E., & Korkmaz, E. K. (2025). Randomized control trial in nursing education: A bibliometric analysis and visualization. *Nurse Education in Practice,* 86, 104394. https://doi.org/10.1016/j.nepr.2025.104394

Caiado, R., Nascimento, D., Quelhas, O., Tortorella, G., & Rangel, L. (2018). Towards sustainability through green, lean and six sigma integration at service industry: Review and framework. *Technological and Economic Development of Economy, 24*(4), 1659–1678. https://doi.org/10.3846/tede.2018.3119

Daryanto. (2014). *Pendekatan Pembelajaran Saintifik Kurikulum 2013*. Yogyakarta: Penerbit Gava Media.

Dawana, I. R., Dwikoranto, D., Setiani, R., & Marsini, M. (2022). E-book learning research in physics education during the last five years: a review and bibliometric study. *Journal of Physics: Conference Series, 2392*, 1-7. http://doi.org/10.1088/1742-6596/2392/1/012016

Erman dan Suyatno. (2022). *Pembelajaran Sains Berbasis Kearifan Lokal (Mengidentifikasi, Mendefinisikan, Menjelaskan, dan Menerapkan)*. Surabaya

Febriyanti, & Subiki. (2017). The development of science learning module based on brass local wisdom in the subject of heat in junior high school. *International Journal Of Advanced Research. 5*(9), 1036-1041.

Gede Agung, D. A., Nasih, A. M., Sumarmi, Idris, & Kurniawan, B. (2024). Local wisdom as a model of interfaith communication in creating religious harmony in Indonesia. *Social Sciences & Humanities Open*, 9, 100827. https://doi.org/10.1016/j.ssaho.2024.100827

Guo, Y. M., Huang, Z. L., Guo, J., Li, H., Guo, X. R., & Nkeli, M. J. (2019). Bibliometric analysis on smart cities research. *Sustainability (Switzerland), 11*(13), 1–8. https://doi.org/10.3390/su11133606

Haryani, C. S., & Sudin, A. (2020). Analisis bibliometrik tren publikasi dan tingkat kolaborasi pada model situation-based learning (2010-2019). *Jurnal Pena Ilmiah, 3*(2), 131–140. https://doi.org/10.17509/jpi.v3i2.27384

Heersmink, R., van den Hoven, J., van Eck, N. J., & van Berg, J. den. (2011). Bibliometric mapping of computer and information ethics. *Ethics and Information Technology, 13*(3), 241–249. https://doi.org/10.1007/s10676-011-9273-7

Huynh, N., De Mello, L., & Li, K. (2025). Evolution of investor sentiment: A systematic literature review and bibliometric analysis. *International Review of Economics & Finance*, 100, 104115. https://doi.org/10.1016/j.iref.2025.104115

Karakus, M., Ersozlu, A., & Clark, A. C. (2019). Augmented reality research in education: A bibliometric study. *Eurasia Journal of Mathematics, Science and Technology Education, 15*(10), 1-12. https://doi.org/10.29333/ejmste/103904

Lestari , Admoko, S., & Suprapto, N. (2022). Identifikasi konsep fisika pada kearifan lokal Kayangan Api di Kabupaten Bojonegoro. *JPF (Jurnal Pendidikan Fisika) FKIP UM Metro. 10(*1). https://dx.doi.org/10.2412/jpf.v10il.4707

Mahrinasari, M. S., Bangsawan, S., & Sabri, M. F. (2024). Local wisdom and government's role in strengthening the sustainable competitive advantage of creative industries. *Heliyon, 10*(10), e31133. https://doi.org/10.1016/j.heliyon.2024.e31133

Nuryudi. (2016). Analisis bibliometrika islam: Studi kasus dokumentasi publikasi ilmiah di UIN Syarif Hidayatullah Jakarta. *Al-Maktabah: Jurnal Kajian Ilmu Perpustakaan dan Informasi, 15*(1), 27–38. https://doi.org/10.15408/almaktabah.v15i1.4713

nXr. (2022, February 9). *How recent is recent for good referencing? Next X(G)eneration referencing*. Accessed from https://nxref.com/recent-research-works-for-good-referencing/

Pan, X., Li, J., Liu, P., Li, J., Zhao, M., Wu, Y., Ji, S., Ren, T., Jiang, Q., & Zhang, S. (2025). Global trends in endometrial cancer and metabolic syndrome research: A bibliometric and visualization analysis. *Computers in Biology and Medicine*, 192, 110362. https://doi.org/10.1016/j.compbiomed.2025.110362

Rahmati, U., Rahmatillah, S., Nufus, Safriana, & Novita, N. (2022). Pemanfaatan alat penumbuk beras tradisional Aceh (JEUNGKI) sebagai media pembelajaran fisika berbasis kearifan lokal. *Jurnal Pendidikan dan Ilmu Fisika (JPIF), 2*(2), 125-130. http://dx.doi.org/10.52434/jpif.v2i2.1952

Ramirez, R., Ravetz, J., Sharpe, B., & Varley, L. (2019). We need to talk (more wisely) about wisdom: A set of conversations about wisdom, science, and futures. *Futures,* 108, 72–80. https://doi.org/10.1016/j.futures.2019.02.002

Ridwan N A. (2007). Landasan keilmuan kearifan lokal. *Jurnal Study Islam dan Budaya 5*(1): 27-38. https://doi.org/10.30983/it.v4i2.3428

Rosadi, P. R., Rapi, N. K., & Yasa, P. (2019) Penerapan bahan ajar sains berbasis kearifan budaya lokal untuk meningkatkan aktivitas dan prestasi belajar fisika siswa kelas X MIPA 2 di SMA Negeri. *Jurnal Pendidikan Fisika Undiksha, 9*(2). https://doi.org/10.23887/jjpf.v9i2.22100

Sakti, S. A., Endraswara, S., & Rohman, A. (2024). Revitalizing local wisdom within character education through ethnopedagogy apporach: A case study on a preschool in Yogyakarta. *Heliyon, 10*(10), e31370. https://doi.org/10.1016/j.heliyon.2024.e31370

Sasvári, P., & Lendvai, G. F. (2025). The overrepresentation of the United States in the field of legal studies in the science-wide author databases of standardized citation indicators. *Journal of Informetrics, 19*(3), 101680. https://doi.org/10.1016/j.joi.2025.101680

Satriawan, M., & Rosmiati. (2016). Pengembangan bahan ajar fisika berbasis kontekstual dengan mengintegrasikan kearifan lokal untuk meningkatkan pemahaman

konsep fisika pada mahasiswa. *JPPS (Jurnal Penelitian Pendidikan Sains), 6*(1), 1212–1217. https://doi.org/10.26740/jpps.v6n1.p1212-1217

Sibarani, R., Simanjuntak, P., & Sibarani, E. J. (2021). The role of women in preserving local wisdom Poda Na Lima 'Five Advices of Cleanliness' for the community health in Toba Batak at Lake Toba area. *Gaceta Sanitaria*, *35*, S533–S536. https://doi.org/10.1016/j.gaceta.2021.10.086

Shufa, N. K. F., (2018). Pembelajaran berbasis kearifan lokal di sekolah dasar: sebuah kerangka konseptual. *Inopendas Jurnal Ilmiah Kependidikan. 1*(1) 48–53. https://doi.org/10.24176/jino.v1i1.2316

Utami, I. D., Anshori, N., Saptaningtyas, H., & Astuti, S. P. (2025). A food resilience model integrating local wisdom and sociotechnical dynamic systems: Case study flood-affected communities in the Bengawan Solo area. *Progress in Disaster Science*, 26, 100413. https://doi.org/10.1016/j.pdisas.2025.100413

Wagiran. (2009). *Pengembangan model pendidikan kearifan lokal di wilayah Propinsi DIY dan mendukung perwujudan visi pembangunan DIY menuju tahun 2025.* Yogyakarta: Setda Provinsi DIY.

Yulianingsih, S., Kurnia, D., & Julia, J. (2020). Pemetaan sistematik dalam topik kajian problem posing berdasarkan analissis bibliometrik. *Jurnal Pena Ilmiah, 3*(2), 1-11. https://doi.org/10.17509/jpi.v3i2.26477

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