JPPIPA 9(Special Issue) (2023)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Empowering Students' Scientific Literacy Using Local Wisdom-Based Ethnobotany Atlas Media

Yuni Gayatri[1], Sela Rizqiyah[1*], Peni Suharti[1]

[1] Department of Biology Education Faculty of Teacher Training and education, Muhammadiyah University of Surabaya, Indonesia.

Received: October 22, 2023
Revised: November 27, 2023
Accepted: December 25, 2023
Published: December 31, 2023

Corresponding Author:
Sela Rizqiyah
ms.selarizqiyah@gmail.com

DOI: 10.29303/jppipa.v9iSpecialIssue.5899

© 2024 The Authors. This open access article is distributed under a (CC-BY License)

Abstract: Students' scientific literacy is influenced by various factors, including the choice of teaching materials used at school. An ethnobotanical atlas based on local wisdom is a collection of information or images that identify and document plants that exist around a particular community's residence or area, which can also be used by humans as food, medicine and so on. This research aims to determine the influence of ethnobotanical atlas media based on local wisdom on students' scientific literacy. This research is a pre-experimental research with a one group pretest-posttest design. The research sample was students of class X MIA 1 SMA Muhammadiyah 1 Surabaya. The data collection technique uses a written test. Data analysis was carried out statistically using normality tests, homogeneity tests, T and N gain tests. The results of the analysis showed that the data was normally distributed. The results of the T test show a significant effect of using ethnobotanical atlas media based on local wisdom on students' scientific literacy with a significance level of 0.000<0.05. Meanwhile, the results of the N-Gain test show that the use of ethnobotanical atlas media based on local wisdom is quite effective in increasing scientific literacy and can be alternative learning resource.

Keywords: Atlas ethnobotany; Literacy science; Local Wisdom

Introduction

Scientific literacy is one of the competencies that students must have in the 21st century. Scientific literacy is a person's ability to explain natural phenomena scientifically, design and evaluate scientific investigation activities, and interpret scientific data and evidence to make decisions and solve problems (Gormally et al., 2009; Oktaviani et al., 2023; Dibyantini et al., 2023). Scientific literacy is not just literacy about scientific content, but also how science is used to adapt to very rapid changes in life (Wasis et al., 2020), a person's ability to understand and communicate science, apply scientific knowledge to solve problems, improve attitudes and sensitivity towards the environment (Handayani et al., 2018; Aqil, 2017; Holbrook, 1997). It can be concluded that scientific literacy is a person's ability to understand scientific content, investigate and communicate and use knowledge to solve life problems related to that context.

Students' scientific literacy still needs to be trained. Based on the results of a study conducted by PISA (Program for International Assessment), when compared with all countries, the scientific literacy of Indonesian students is still in a low position. In 2022, mathematics and science literacy will decrease from 379 in 2018 to 36 (OECD, 2023). The research results show that junior high school students scientific literacy still low (Nuryanti et al., 2023; Hasasiyah et al., 2019). Learning in schools is still not optimal in developing students' scientific literacy. There are several factors that influence students' low scientific literacy. According to Fuadi et al. (2020), Suparya et al. (2022), Alvina et al. (2022), Yusmar et al. (2023) these factors are the choice of textbooks or teaching materials, misconceptions, non-contextual learning and students' reading abilities. Learning that emphasizes scientific literacy in Indonesia

How to Cite:
Gayatri, Y., Rizqiyah, S., & Suharti, P. (2023). Empowering Students' Scientific Literacy Using Local Wisdom- Based Ethnobotany Atlas Media. *Jurnal Penelitian Pendidikan IPA*, *9*(SpecialIssue), 953-959. https://doi.org/10.29303/jppipa.v9iSpecialIssue.5899

is still mostly based on textbook material. Dragos (2015) add spesialty literature focuses largely on scientific literacy in the compulsory education. Therefore, the development and implementation of teaching materials as media or learning resources for enrichment in developing scientific literacy is still needed (Zahro et al., 2021; Rahmani et al., 2021).

Science is essentially not just a product but also a process, attitude and technology. Scientific literacy regarding the diversity of plants in students' environments and their use by the community is still minimal due to limited learning media that students can use at school as enrichment material. One alternative that can be used is an ethnobotanical atlas. Ethnobotany is part of ethnobiology which focuses on the use of biological resources (Hidayah & Al Hakim, 2022), is a study that studies the relationship between plants and humans (Kandowangko et al., 2010). An ethnobotanical atlas is a collection of information or images that identify and document plants that exist around a residence or certain community area, which can also be used by humans as food, medicine and so on. According to Encep Andriana (2021), so that students have the means to apply their knowledge to appreciate and preserve culture, in biology/science learning, local wisdom can be integrated.

The ethnobotany atlas is a science product that functions as a science learning medium. As a science learning medium, it has the characteristics of being produced through a series of scientific research or inquiry activities using science process skills (Setiawati & Gayatri, 2022) and influencing thinking skills (Listiana et al., 2023). An adequate understanding of the nature of science can understand scientific content by connecting scientific concepts as to obtain coherent scientific knowledge (Erdas Kartal et al., 2018). Science learning needs to be sought so that there is balance or harmony between scientific knowledge itself and the cultivation of scientific attitudes and the character education strengthening (Hikmawati et al., 2021), as well as local wisdom values that exist and are developing in society. The local wisdom values that exist in society receive little attention in the learning process at school, even though these values are still very relevant to be applied in social life and can maintain the integrity of the Indonesian nation. Education functions to empower human potential to inherit, develop and build future culture and civilization (Suastra, 2010).

Method

This research is a Pre-Experiment research with One-Group Pretest-Posttest Design. The research sample was 26 students of class MIA 1 SMA Muhammadiyah 1 Surabaya using purposive sampling technique. The scientific literacy indicators seen in the competency aspect of explaining phenomena scientifically through recognizing, offering and evaluating explanations for various natural and technological phenomena (Khery et al., 2022; Reiska, 2014). The instrument used is an essay test given before learning (pretest) and after learning (posttest). The stages of this research are as shown in figure 1.

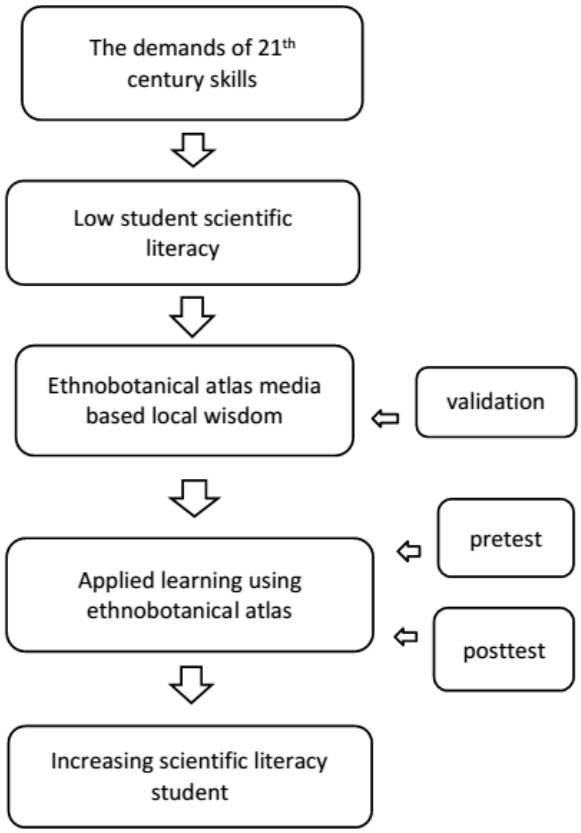

Figure 1. Research stages chart

Result and Discussion

The ethnobotanical atlas was developed according to the modified learning media validation instrument criteria according to BNSP. The Ethnobotany Atlas has an initial and an internal section. The initial page display includes several images of plant samples and a map of the research location. The section in the ethnobotanical atlas contains the author's foreword, a table of contents of the names of identified plants followed by the contents section. The contents of the page displays photographs of real plants (their appearance) along with scale images found in the research location environment. This section also introduces regional names known to the local community, as well as plant classification based on identification results using taxonomic references and plant classifications including Class, Division, Order, Family and Species.

Based on the validation results, revisions have been made according to the validators' input so that it is suitable for use in schools. The form of the ethnobotanical atlas in question is as shown in the following image.

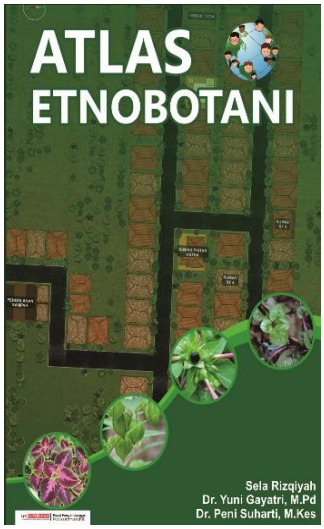

Figure 2. Cover

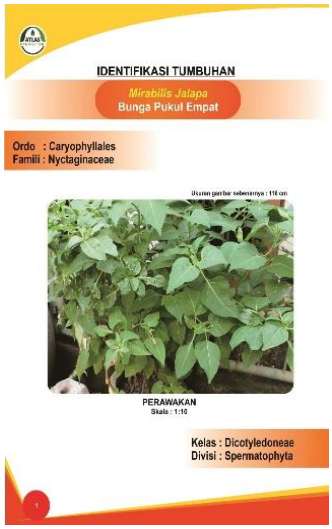

Figure 3. Plant appearance

Figure 4. Plant description

Figure 5. Plant description

The ethnobotanical atlas was developed according to the modified learning media validation instrument criteria according to BNSP. The validation test was carried out by validators consisting of two material and media experts, three biology teachers. The validation results are in the following Table 1.

Table 1. Validation Result Data

Assessment Components	Average Score	Category Mode
Aspects of content and scientific literacy	3.6	Very valid
Structural aspects of the Atlas	3.8	Very valid
Aspects of media Preparation	3.6	Very valid
Display aspect	3.6	Very valid
Graphic aspects of Image	3.6	Very valid
Cover aspect	3.7	Very valid

The results of the normality test of student learning outcomes after using the Ethnobotany atlas can be seen in the following Table 2.

Table 2. Normality Test One-Samples Kolmogorov-Smirnov Test

N		26
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	4.36585791
Most Extreme Differences	Absolute	.086
	Positive	.086
	Negative	-.074
Test Statistic		.086
Asymp. Sig. (2-tailed)		.200[c,d]

The results of the data normality test showed that the data were normally distributed with an Asmp.Sig value of 0.200>0.05 by one samples Kolmogorov Smirnov Test. Based on these results, the T-test is continued shown as in the Table 3.

Table 3. T-Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair1	Pretest - Posttest	-3.680 77E1	11.82 546	2.319 16	-41.584 10	-32.03 129	-15.8 71	25	.000

Based on the data from the T-test results table 3, its known that the sig (2-talled) value is 0.000<0.05, meaning that there is a significant difference in students' scientific literacy before and after using ethnobotanical atlas media based on local wisdom. To see the increase in students' scientific literacy, the N-Gain test was continued. N-Gain test results in the following table 4.

The N-Gain test results obtained were 68.188% based on table 5, including the quite effective category.

This shows that the use of ethnobotanical atlas media based on local wisdom can improve students' ability to understand the characteristics of plants around them and their use by the community in their daily lives. Increasing student's knowledge regarding the scientific names or latin names of living creatures, especially plants, as explained by Kameswari, (2022) that students' knowledge regarding the use of latin teminology is obtained from the results of responses and reactions as a result or impression obtained during the process of biology learning activities. Enriching science learning resources that come from the environment makes it easier for students to understand nature-based learning objects and has an impact on achievement (Effiong & Igiri, 2015). Local wisdom based teaching material increased the students scientific literacy (Suryanti et al., 2020), support adult literacy program (Laksono et al., 2018).

Table 4. N-Gain Test

		Descriptive		
N Gain_Persen	Control		Statistic	Std. error
1	Mean		68.1926	1.600 88
	95% ConfidenceInterval for Mean	Lower Bound	64.8955	
		Upper Bound	71.4897	
	5% Trimmed Mean		68.1884	
	Median		68.5855	
	Variance		66.633	
	Std. Deviatior		8.16293	
	Minimum		52.94	
	Maximum		83.33	
	Range		30.39	
	Interquartile Range		11.77	
	Skewness		-.015	.456
	Kurtosis		-.638	.887

Table 5. Categories of N-Gain Test Results

Percentage (%)	Category
<40	Ineffective
40 – 55	Less effective
56 – 75	Effective enough
<76	Effective

(Hake, 1999)

In learning using an ethnobotany atlas, students not only get to know the plants around them, but also understand how people who have traditionally used these plants for generations in their daily lives. By utilizing the environment as a science learning resource, students will have a better understanding of scientific literacy, which is more applicable because they find these plants in their daily lives (Kristyowati & Purwanto, 2019). Understanding science or biology can only be obtained if students can understand the process of science (Robiatul et al., 2020) and its application in life (Jamaluddin et al., 2019). Recent studies show that through an ethnobiological approach, children who study nature have more insight into scientific knowledge and more advanced scientific reasoning (Gallois & Reyes-Garciá, 2018).

Science education aims to increase scientific literacy (Holbrook, 2010; Astriawati & Djukri, 2019) Scientific literacy is not only understanding science, communicating, but also applying scientific knowledge in solving problems, so that you have an attitude and sensitivity towards the surrounding environment in making decisions (Gormally et al., 2009; Ardianto & Rubini, 2016). Understanding science or biology can only be obtained if students can understand the scientific process (Robiatul et al., 2020), educators work to influence students' ability to view science through a more holistic lens (Lederman et al., 2013). This local wisdom-based Ethnobotany atlas can be used as a learning resource in schools that can teach the culture of the Indonesian people in a particular place. Apart from the pictures, there are also people's habits of using these plants as medicine. According to Andriana et al. (2017), community habits, which can be in the form of values, culture and religion, are local wisdom in oral form in the community's social system.

Ethnobotany is a branch of ethnoscience, which is knowledge related to natural objects and events that are organized into community knowledge and produced from a particular culture (Abonyi, 2007). Knowledge obtained by certain communities through processes such as observation, classification and solving problems with culture in society through the process of constructing original knowledge into scientific knowledge (Sarwi et al., 2023). Apart from being a source of knowledge, ethnoscience is an approach to

learning science, and its implementation can be obtained from the use of various local wisdom. The local wisdom-based Ethnobotany Atlas integrates indigenous knowledge into scientific knowledge and utilizes the wealth of local plants into teaching materials.

The use of ethnobotany based on local wisdom is quite effective in increasing students' scientific literacy. Ethnoscience (including ethnobotany) has a positive impact on science learning outcomes. Apart from making science more relevant to students in culturally diverse classrooms (Beer et al., 2009), providing positive experiences (Winarto et al., 2023), increasing students' mastery of concepts and character (Sarwi et al., 2023), it is effective in improving various student abilities and skills such as thinking skills, problem solving skills, process skills and scientific literacy (Pratama & Jumadi, 2023). As a learning medium, many research results show that teaching materials developed from local culture have been proven to facilitate students in solving every day problems (Syazali & Umar, 2022).

Conclusion

Based on the results of the discussion, it can be concluded that the use of the Ethnobotany Atlas media based on local wisdom has an effect on students' scientific literacy. Literacy regarding the use of plants in society needs to be given to students, in order to increase their knowledge about plant biological resources in the environment and how to use them in life. The use of ethnobotanical atlas media can also empower students' potential to inherit the culture of Indonesian society.

Acknowledgments
Thank you to Ir. Ruspeni Daesusi, M.Kes, Sitta Amaliyah S.Si., M.Si (lecturer), and Rini Megawati Ningsih, S.Pd., Lina Naikin Najah, S.Pd., Tiara Alyati Nindia S.Pd., (Biology Teachers) as validator of this local wisdom-based ethnobotany atlas. Thank you also to students of class X MIA SMA Muhammadiyah 1 Surabaya who have contributed in this research.

Author Contributions
All authors contributed to every stage of research, have read and agreed to the published version of the manuscript.

Funding
This research received no external funding.

Conflicts of Interest
The authors have declared that no there are no conflict of interest associated wirh the publication of this paper.

References

Abonyi, O. S. (2007). *Effect of an Ethnoscience-Based Instructional Package on Students' Conception of Scientific Phenomena and Interest in science* (Issue March, pp. 2–8). Ojnuka Arinze University of Nigeria Ojionuka.

Alvina, S., Mellyzar, M., & Zahara, S. R. (2022). Influence of POGIL and MFI Models on Science Literacy and Science Process Skills for Junior High School. *Jurnal Penelitian Pendidikan IPA*, *8*(4), 2201–2209. https://doi.org/10.29303/jppipa.v8i4.2121

Andriana, E., Syachruroji, A., Alamsyah, T. P., & Sumirat, F. (2017). Natural science Big Book with Baduy local wisdom base media development for elementary school. *Jurnal Pendidikan IPA Indonesia*, *6*(1), 76–80. https://doi.org/10.15294/jpii.v6i1.8674

Aqil, D. I. (2017). Literasi Sains Sebagai Konsep Pembelajaran Buku Ajar Biologi Di Sekolah. *Wacana Didaktika*, *5*(02), 160. https://doi.org/10.31102/wacanadidaktika.v5i02.59

Ardianto, D., & Rubini, B. (2016). Comparison of students' scientific literacy in integrated science learning through model of guided discovery and problem based learning. *Jurnal Pendidikan IPA Indonesia*, *5*(1), 31–37. https://doi.org/10.15294/jpii.v5i1.5786

Astriawati, F., & Djukri. (2019). Developing Chamilo-Based E-Learning in Environmental Change Material to Enhance Students' Scientific Literacy Skills. *Journal of Physics: Conference Series*, *1397*(1). https://doi.org/10.1088/1742-6596/1397/1/012049

Beer, J. D., & Whitlock, E. (2009). Indigenous knowledge in the life sciences classroom: Put on your de Bono hats!. *The American Biology Teacher, 71*(4), 209-216. https://doi.org/10.1662/005.071.0407

Dibyantini, R. E., Amdayani, S., Siregar, M. I., & Syafriani, D. (2023). Application of STEM-PjBL Based Chemistry Module to Improve Science Literacy and Student Learning Motivation. *Jurnal Penelitian Pendidikan IPA*, *9*(SpecialIssue), 95–102. https://doi.org/10.29303/jppipa.v9ispecialissue.5872

Dragoş, V., & Mih, V. (2015). Scientific Literacy in School. *Procedia-Social and Behavioral Sciences*, *209*(July), 167–172. https://doi.org/10.1016/j.sbspro.2015.11.273

Effiong, O. E., & Igiri, C. E. (2015). Impact of Instructional Materials in Teaching and Learning of Biology in Senior Secondary Schools in Yakurr LG A. *International Letters of Social and Humanistic Sciences*, *62*, 27–33. https://doi.org/10.18052/www.scipress.com/ilshs.62.27

Encep Andriana, R. S. N. H. (2021). Pengembangan Media Ruliba Berbasis Kearifan Lokal Pada

Pembelajaran Keseimbangan Ekosistem Ilmu Pengetahuan Alam. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, *10*(3), 501–514. https://doi.org/10.33578/jpfkip.v10i3.8087

Erdas Kartal, E., Cobern, W. W., Dogan, N., Irez, S., Cakmakci, G., & Yalaki, Y. (2018). Improving science teachers' nature of science views through an innovative continuing professional development program. *International Journal of STEM Education*, *5*(1). https://doi.org/10.1186/s40594-018-0125-4

Fuadi, H., Robbia, A. Z., Jamaluddin, J., & Jufri, A. W. (2020). Analisis Faktor Penyebab Rendahnya Kemampuan Literasi Sains Peserta Didik. *Jurnal Ilmiah Profesi Pendidikan*, *5*(2), 108–116. https://doi.org/10.29303/jipp.v5i2.122

Gallois, S., & Reyes-Garciá, V. (2018). Children and ethnobiology. *Journal of Ethnobiology*, *38*(2), 155–169. https://doi.org/10.2993/0278-0771-38.2.155

Gormally, C., Brickman, P., Hallar, B., & Armstrong, N. (2009). Effects of Inquiry-based Learning on Students' Science Literacy Skills and Confidence. *International Journal for the Scholarship of Teaching and Learning*, *3*(2). https://doi.org/10.20429/ijsotl.2009.030216

Handayani, G., Adisyahputra, A., & Indrayanti, R. (2018). Correlation between integrated science process skills, and ability to read comprehension to scientific literacy in biology teachers students. *Biosfer*, *11*(1), 22–32. https://doi.org/10.21009/biosferjpb.11-1.3

Hasasiyah, S. H., Hutomo, B. A., Subali, B., & Marwoto, P. (2019). Analisis Kemampuan Literasi Sains Siswa SMP pada Materi Sirkulasi Darah. *Jurnal Penelitian Pendidikan IPA*, *6*(1), 5. https://doi.org/10.29303/jppipa.v6i1.193

Hidayah, H. A., & Al Hakim, R. R. (2022). Etnobotani: Belajar dari Pemanfaatan Tumbuhan Liar. *Sintesa: Jurnal Ilmu Pendidikan*, *17*(1), 8–14. Retrieved from https://sintesa.stkip-arrahmaniyah.ac.id/index.php/sintesa/article/view/46

Hikmawati, H., Gunawan, G., Sahidu, H., & Kosim, K. (2021). Effect of Local Culture Based Learning in Science on Critical Thinking and Student Communication Skills. *Journal of Science and Science Education*, *2*(1), 8–16. https://doi.org/10.29303/jossed.v2i1.713

Holbrook, J. (2010). Education through science as a motivational innovation for science education for all. *Science Education International*, *21*(2), 80–91. Retrieved from http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=EJ890663

Holbrook, J., & Rannikmae, M. (1997). *Supplementary Teaching Material Promoting Scientific and Technological Literacy*. International Council of Associations for Science Education. Retrieved from http:/sunsite.anu.edu.au/icase

Jamaluddin, J., Jufri, A. W., Ramdani, A., & Azizah, A. (2019). Profil Literasi Sains Dan Keterampilan Berpikir Kritis Pendidik Ipa Smp. *Jurnal Penelitian Pendidikan IPA*, *5*(1). https://doi.org/10.29303/jppipa.v5i1.185

Kameswari, D. (2022). Pengetahuan Mahasiswa Biologi Terhadap Penggunaan Terminologi Bahasa Latin. *Research and Development Journal of Education*, *8*(1), 256. https://doi.org/10.30998/rdje.v8i1.11187

Kandowangko, Solang, & Ahmad. (2010). Kajian etnobotani tanaman obat oleh masyarakat Kabupaten Bonebolango Provinsi Gorontalo. *Penelitian Unggulan Pusat Studi, 2*(737). Retrieved from https://repository.ung.ac.id/riset/show/2/737/kajian_etnobotani_tanaman_obat_oleh_masyarakat__kabupaten_bonebolango_provinsi_gorontalo.html

Khery, Y., Sarjan, M., Ahzan, S., & Efendi, I. (2022). Konseptualisasi Literasi Sains Mengacu pada Kerangka Sains PISA Sejak Tahun 2000. *Educatoria: Jurnal Ilmiah Ilmu Pendidikan, 2*(4), 194-225. https://doi.org/10.36312/ejiip.v2i4.117, 2(4), 200–231.

Kristyowati, R., & Purwanto, A. (2019). Pembelajaran Literasi Sains Melalui Pemanfaatan Lingkungan. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *9*(2), 183–191. https://doi.org/10.24246/j.js.2019.v9.i2.p183-191

Laksono, B. A. S., & Wahyuni, S. (2018). an Investigation of Local Wisdom To Support Adult Literacy Program. *PEOPLE: International Journal of Social Sciences*, *4*(2), 1320–1336. https://doi.org/10.20319/pijss.2018.42.13201336

Lederman, N. G., Lederman, J. S., & Antink, A. (2013). Nature of Science and Scientific Inquiry as Contexts for the Learning of Science and Achievement of Scientific Literacy. *International Journal of Education in Mathematics Science and Technology (IJEMST)*, *1*(3), 138–147. Retrieved from https://ijemst.net/index.php/ijemst/article/view/19

Listiana, L., Loka, N. M., & Gayatri, Y. (2023). Does student's critical thinking and collaboration skills can empower through investigation and thinking learning strategy? *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *9*(3), 315–325. https://doi.org/10.22219/jpbi.v9i3.25118

Nuryanti, T., Pursitasari, I. D., & Rubini, B. (2023). Science Literacy Profile of Junior High School Students on Climate Change Material. *Jurnal*

Penelitian Pendidikan IPA, *9*(11), 9391–9396. https://doi.org/10.29303/jppipa.v9i11.5208

OECD. (2023). *PISA 2022 Results (Volume II): Learning During – and From – Disruption*. Paris: OECD Publishing,. https://doi.org/10.1787/a97db61c-en.

Oktaviani, C., Seprianto, S., & Putri, M. D. (2023). Creative Thinking-Oriented Students' Scientific Literacy Skills: Preliminary Study. *Jurnal Penelitian Pendidikan IPA*, *9*(10), 8245–8250. https://doi.org/10.29303/jppipa.v9i10.5520

Pratama, D. H., & Jumadi, J. (2023). Analysis the Implementation of Ethnoscience Approach in Learning Science. *Jurnal Penelitian Pendidikan IPA*, *9*(4), 1615–1620. https://doi.org/10.29303/jppipa.v9i4.2721

Rahmani, Mustadi, A., Maulidar, & Senen, A. (2021). the Development of Teaching Materials Based on Context and Creativity To Increase Students Scientific Literacy. *Jurnal Ilmiah Peuradeun*, *9*(2), 345–364. https://doi.org/10.26811/peuradeun.v9i2.506

Robiatul, L., Setiono, S., & Suhendar, S. (2020). Profil Keterampilan Proses Sains Siswa Kelas VII SMP Pada Materi Ekosistem. *Biodik*, *6*(4), 519–525. https://doi.org/10.22437/bio.v6i4.10295

Sarwi, S., Fathonah, S., Anis, M., Rozi, F., Wardani, S., & Winarto, W. (2023). Effects of Teaching Materials on Learning Salt Factory Topics Based on Ethnoscience to Improve Mastery of Students Concepts and Life Skills. *Jurnal Penelitian Pendidikan IPA*, *9*(11), 10418–10425. https://doi.org/10.29303/jppipa.v9i11.5611

Setiawati, H. H., & Gayatri, Y. (2022). Efektivitas Lembar Kegiatan Peserta Didik berbasis Strategi ISFBL untuk Melatihkan Keterampilan Berpikir Kritis Siswa. *Jurnal Penelitian, Pendidikan Dan Pengajaran: JPPP*, *3*(2), 177–184. https://doi.org/10.30596/jppp.v3i2.11982

Suastra, I. W. (2010). Model Pembelajaran Sains Berbasis Budaya Lokal Untuk Mengembangkan Kompetensi Dasar Sains dan Nilai Kearifan Lokal di SMP. *Jurnal Pendidikan Dan Pembelajaran*, *43*(2), 8–16. https://doi.org/10.23887/jppundiksha.v43i1.1697

Suparya, I. K., I Wayan Suastra, & Putu Arnyana, I. B. (2022). Rendahnya Literasi Sains: Faktor Penyebab Dan Alternatif Solusinya. *Jurnal Ilmiah Pendidikan Citra Bakti*, *9*(1), 153–166. https://doi.org/10.38048/jipcb.v9i1.580

Suryanti, S., Mariana, N., Yermiandhoko, Y., & Widodo, W. (2020). Local wisdom-based teaching material for enhancing primary students' scientific literacy skill. *Jurnal Prima Edukasia*, *8*(1), 96–105. https://doi.org/10.21831/jpe.v8i1.32898

Syazali, M., & Umar, U. (2022). Peran Kebudayaan Dalam Pembelajaran IPA Di Indonesia: Studi Literatur Etnosains. *Jurnal Educatio FKIP UNMA*, *8*(1), 344–354. https://doi.org/10.31949/educatio.v8i1.2099

Wasis, Rahayu, Y. S., Sunarti, T., & Indana, S. (2020). *HoTs dan Literasi Sains: Konsep, Pembelajaran dan Penilaiannya*. Jombang, JawaTimur: Kun Fayakun.

Winarto, W., Kristyaningrum, D. H., Pamungkas, A., & Wulandari, P. (2023). Ethnosains of The Javanese Community "The Body Funeral Process" as A Resource of Basic Science Learning. *Jurnal Penelitian Pendidikan IPA*, *9*(10), 8601–8609. https://doi.org/10.29303/jppipa.v9i10.4959

Yusmar, F., & Fadilah, R. E. (2023). Analisis Rendahnya Literasi Sains Peserta Didik Indonesia: Hasil Pisa Dan Faktor Penyebab. *LENSA (Lentera Sains): Jurnal Pendidikan IPA*, *13*(1), 11–19. https://doi.org/10.24929/lensa.v13i1.283

Zahro, U. R., Sumarni, W., & Linuwih, S. (2021). The Development of Test Instruments to Measure the Science Literation Skills of Junior High School Students in Global Warming Themes. *Journal of Innovative Science Education*, *9*(3), 17–27. https://doi.org/10.15294/jise.v9i1.37431