39. Analysis of Elementary School IPAS Material in Merdeka.pdf

by specialgra2025_4 specialgra2025_4

Submission date: 27-Jul-2025 02:37PM (UTC+0300)
Submission ID: 2689072504
File name: 39._Analysis_of_Elementary_School_IPAS_Material_in_Merdeka.pdf (1,009.16K)
Word count: 3967
Character count: 22614

Analysis of Elementary School IPAS Material in Merdeka Curriculum to Support the Implementation of Education for Sustainable Development

Suratmi Suratmi*, Dwi Cahaya Nurani, Laihat Laihat, Ermayanti Ermayanti, Putri Durrotul Hikmah

Universitas Sriwijaya, Palembang, 30662, Indonesia
suratmi@fkip.unsri.ac.id

Abstract. Education for Sustainable Development (ESD) is an educational approach that integrates sustainability concepts into the learning process to prepare younger generations for global challenges. This study analyzes the curriculum documents and textbooks of the elementary school subject "IPAS" within the Merdeka Curriculum. The study aims to describe the content in the elementary school IPAS subject that can be used for the implementation of ESD. The research method employed was qualitative content analysis, focusing on the identification and evaluation of ESD components within the IPAS materials used in the Merdeka Curriculum textbooks. The results indicated that the IPAS content in the Merdeka Curriculum covered 11 key ESD themes: (1) biodiversity; (2) climate change; (3) disaster risk reduction; (4) cultural diversity; (5) poverty reduction; (6) gender equality; (7) health improvement; (8) sustainable lifestyles; (9) peace and human safety; (10) water crisis prevention; and (11) sustainable population migration. Based on the analysis, the textbooks in the Merdeka Curriculum addressed topics related to sustainability issues. Among the 11 topics, biodiversity was the most frequently covered theme, while sustainable population migration was the least covered. The ESD topics identified still require appropriate media, learning resources, and teaching strategies.

Keywords: Content Analysis, Education for Sustainable Development, Elementary School IPAS, Merdeka Curriculum, Sustainability.

1 Introduction

Education serves as a fundamental foundation in shaping generations capable of facing global challenges, particularly regarding environmental sustainability issues. Currently, awareness of the importance of sustainability is growing, especially through the global implementation of Education for Sustainable Development (ESD). ESD not only aims to provide knowledge about sustainability, but also to encourage shifts in the way students think and behave so that they can contribute to environmental preservation. This education is holistically designed by incorporating social, economic, and environmental aspects [1].

M. Meilinda et al. (eds.), *Proceedings of the 6th Sriwijaya University Learning and Education International Conference 2024 (SULE-IC 2024)*, Advances in Social Science, Education and Humanities Research 915,
https://doi.org/10.2991/978-2-38476-390-0_17

In Indonesia, the Merdeka Curriculum educational policy offers schools flexibility in designing learning processes tailored to students' needs. This curriculum focuses on character and competency development, including critical and analytical thinking skills. One subject relevant to supporting ESD is IPAS (*Ilmu Pengetahuan Alam dan Sosial*), which combines science and social studies to provide a comprehensive understanding of human-environment relationships. However, the implementation of IPAS in the Merdeka Curriculum still faces various challenges in practice [2]. Previous studies on ESD in Indonesia have primarily focused on secondary and higher education, while its application in elementary schools remains largely unexamined**.** This results in a gap in the literature, particularly regarding how ESD concepts can be integrated into the elementary school curriculum. This research responds by offering a new perspective, exploring how IPAS materials in the Merdeka Curriculum can be adapted to support ESD goals in elementary schools, an area that has been scarcely studied in Indonesia [3]. The application of sustainability education within the Merdeka Curriculum has demonstrated some success, particularly with regard to biodiversity and environmental issues. However, similar to the findings of [4]. it is clear that there is still room for improvement in aligning teaching materials with broader sustainability goals, such as climate change and sustainable consumption.

This study also provides a theoretical analysis of the integration of ESD with elementary IPAS materials, including topics such as natural resource management and the impacts of human activities on ecosystems. Although several studies have highlighted the importance of sustainability education in enhancing students' engagement with global environmental issues, such education at the elementary level in Indonesia has not yet been fully implemented [5]. This study fills that gap by offering a multidisciplinary approach combining global theory with the local context of Indonesia.

Practical challenges in implementing ESD in elementary schools include limited resources, both in terms of material development as well as teacher training. This research aims to identify and analyze IPAS materials in grades III, IV, V, and VI that support ESD in elementary schools. It is expected that teachers will be able to integrate sustainability issues that are engaging and relevant into the lessons so that these topics can be delivered more effectively. This study is also expected to contribute to the development of education that not only focuses on mastering concepts but also on shaping students' mindsets and skills to support sustainability in the long term. It is hoped that this research will help bridge the gap between policy and practical implementation. The results of this research are expected to serve as a guide for teachers in developing more adaptive and relevant teaching strategies focused on sustainability issues. This aligns with the national education goals of producing a generation that is not only intellectually competent but also highly aware of and committed to environmental sustainability.

2 Methods

This study employed a descriptive qualitative design, selected for its ability to provide an in-depth understanding of the integration of ESD (Education for Sustainable Development) concepts within IPAS (*Ilmu Pengetahuan Alam dan Sosial*) materials. The descriptive qualitative design was deemed appropriate because it focuses on content analysis, allowing researchers to identify and evaluate sustainability themes in the teaching materials. Through this approach, the researchers could explore how IPAS materials support sustainability principles and offer recommendations for curriculum development.

Data collection techniques included document analysis, focusing on official curriculum documents and IPAS textbooks for grades III to VI. Researchers conducted a content analysis of the science material in the Merdeka Curriculum for grades III to VI to find out that most of the science material was integrated with ESD principles. These findings can be linked to the 11 main themes outlined by UNESCO for ESD, which are: (1) biodiversity; (2) climate change; (3) disaster risk reduction; (4) cultural diversity; (5) poverty reduction; (6) gender equality; (7) health improvement; (8) sustainable lifestyles; (9) peace and human safety; (10) water crisis prevention; and (11) sustainable population migration. The research stages are illustrated in Figure 1, outlining the research flow. The primary instrument for data collection was content analysis, through which data were gathered by identifying ESD themes embedded in the teaching materials. This analysis enabled a clear mapping of sustainability topics already covered and those that have yet to be included in the curriculum.

The data analysis procedure was carried out systematically in several stages. Data collected from curriculum documents and IPAS textbooks were grouped according to educational phases (Phase B and Phase C) and grade levels. The data were then presented in tables and matrices to facilitate the identification of IPAS materials that support ESD. The analysis procedure also involved triangulation, an essential step to reduce bias and ensure that the analysis accurately reflects the integration of sustainability principles in IPAS materials. The research stages are illustrated in Figure 1, outlining the research flow.

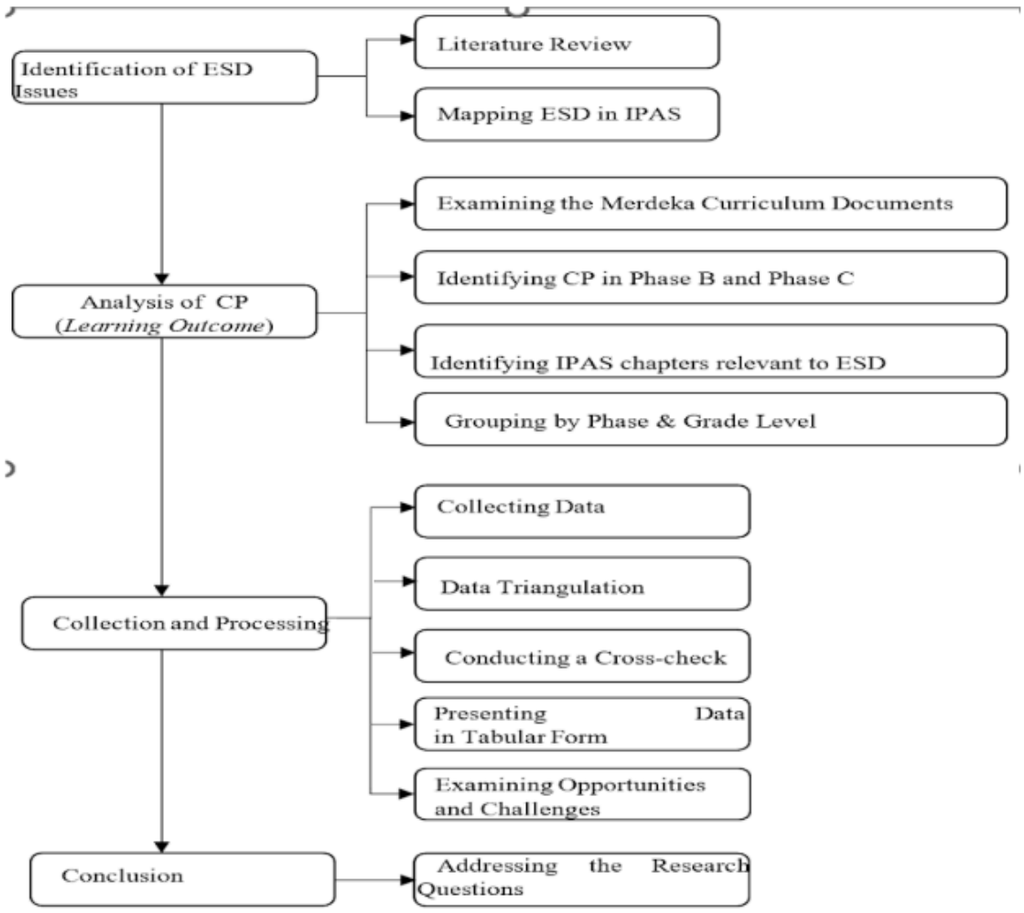

Fig. 1. The stages of the research

This research aims to evaluate the integration of Education for Sustainable Development (ESD) concepts into elementary Natural and Social Sciences (IPAS) instruction. The first step involved identifying ESD-related issues through a literature review on sustainability and mapping ESD concepts within the IPAS materials. This mapping was essential to highlight global challenges and emphasize key ESD elements relevant to the curriculum. Following this, a document analysis of the Merdeka Curriculum was conducted to identify the CP (*Capaian Pembelajaran*) for Phase B (grades 3-4) and Phase C (grades 5-6). IPAS materials that support sustainability were then grouped according to grade level to ensure coherence and alignment in delivering sustainability concepts.

After analyzing the documents, data were gathered through an in-depth review of the official curriculum and IPAS textbooks. The collected data were analyzed using triangulation to ensure the validity and consistency of the findings. This process involved cross-checking various sources of information to ensure accuracy in presenting IPAS concepts within the curriculum and textbooks. Additionally, the data were organized into tables or matrices to facilitate a more detailed analysis of trends and patterns in IPAS materials across different grade levels. The researchers

then conducted a comprehensive analysis of the alignment between IPAS materials and ESD principles, assessing how well these materials support sustainability concepts. This analysis also evaluated the opportunities and challenges encountered in expanding ESD integration at the elementary level, such as limited resources or time constraints in implementing the material.

The final stage of this research involved drawing conclusions based on the findings. These conclusions address the research questions and offer relevant recommendations for policymakers and educators. It is expected that these conclusions will provide new and practical insights for developing ESD-based learning at the elementary level and contribute significantly to future research. The conclusions not only address the research questions but also provide practical recommendations for educators and policymakers concerning the development of learning that supports ESD in elementary schools.

3 Result and Discussion

The analysis of elementary IPAS materials in the Merdeka Curriculum revealed important findings related to ESD principles. The IPAS materials in the Merdeka Curriculum demonstrate a greater effort to contextualize learning with students' daily lives and local issues. This is crucial in the implementation of ESD, as it helps students understand the relevance of learning in real life, while also encouraging them to become agents of environmental change. Wals [6] suggest that integrating sustainable development education into elementary school learning is essential for fostering students' awareness of environmental sustainability. Similarly, Khoiri et al. [7] found that although ESD concepts have been introduced in schools, their implementation has not yet been optimal, particularly in building students' awareness of sustainability.

Based on content analysis of IPAS materials in the Merdeka Curriculum for grades III through VI, it was found that most IPAS materials have integrated ESD principles. These findings can be linked to 11 key themes outlined by UNESCO for ESD, which are: (1) biodiversity; (2) climate change; (3) disaster risk reduction; (4) cultural diversity; (5) poverty reduction; (6) gender equality; (7) health improvement; (8) sustainable lifestyles; (9) peace and human safety; (10) water crisis prevention; and (11) sustainable population migration. The following is Table 1, which maps ESD themes within the Merdeka Curriculum textbooks:

Table 1. Mapping of ESD in merdeka curriculum textbooks

Themes (ESD Issues)	ESD Indicators	Grade			
		III	IV	V	VI
Biodiversity	1) Conducting biodiversity conservation 2) Keeping the environment clean 3) Greening home gardens	Ch. 1 Ch. 2 Ch. 3 Ch. 5 Ch. 8	Ch. 3 Ch. 5	Ch. 2 Ch. 6 Ch. 8	-

Themes	ESD Indicators	Grade			
Climate Change	1) Preventing and mitigating the impacts of climate change 2) Preventing and mitigating environmental Pollution	Ch. 3 Ch. 8	Ch. 4	Ch. 6	Ch. 7
Disaster Risk Reduction	1) Managing disaster risks 2) Anticipating disaster risks 3) Understanding causes of disasters	Ch. 3 Ch. 8	-	Ch. 4 Ch. 8	Ch. 7
Cultural Diversity	1) Understanding family and community traditions 2) Preserving local culture and wisdom	Ch. 6 Ch. 7 Ch. 8	Ch. 7 Ch. 8	Ch. 7	Ch. 2 Ch. 3 Ch. 4
Poverty Diversity	1) Analyzing the role of economics in improving community welfare 2) Understanding various livelihoods in Society	Ch. 8	-	Ch. 7 Ch. 8	-
Gender Equality	1) Carry out the learning process for female and male students 2) Provide equal opportunities for male and female students to express opinions in front of the class 3) Dividing the roles and tasks of male and female students in class fairly 4) Provide equal opportunities in selecting class president	Ch. 2 Ch. 6	Ch. 6	Ch. 5	Ch. 2
Health Improvement	1) Prevent air pollution 2) Dealing with the impacts of air pollution 3) Carrying out activities to plant tree seedlings at schools to reduce air pollution 4) Take action to clean the surrounding environment	Ch. 2 Ch. 4	Ch. 8	Ch. 2 Ch. 6	Ch. 1 Ch. 7
Sustainable Lifestyles	1) Save money on electricity usage 2) Adopt a healthy lifestyle 3) Maintain cleanliness of yourself and the surrounding environment	Ch. 3 Ch. 4	Ch. 1	Ch. 5 Ch. 8	Ch. 6 Ch. 7
Peace and Human Safety	1) Participating in scout and red cross activities 2) Global Youth Service Day	Ch. 7	-	Ch. 7	Ch. 2 Ch. 4
Water Crisis Prevention	1) Understand the causes of the water crisis 2) Prevent water pollution 3) Observe river pollution 4) Carrying out activities to plant tree seedlings at school	Ch. 3	-	Ch. 4 Ch. 8	Ch. 7
Sustainable Population Migration	1) Understanding urbanization and transmigration 2) Migration and emigration	Ch. 8	-	Ch. 6	-

Themes	ESD Indicators	Grade
	3) Observing population shifts in local areas	

Table 2. Description of chapter title

Phase	Grade	Chapter Title		
B	Grade III	Chapter 1: Let's Get to Know the Animals Around Us	Chapter 4: Introduction to Energy	Chapter 7: Stories from the Homeland
		Chapter 2: Let's Learn About the Life Cycle of Living Beings	Chapter 5: Me and My Surroundings	Chapter 8: The Landscape of Indonesia
		Chapter 3: Living in Harmony with Nature	Chapter 6: I Am Part of Society	
	Grade IV	Chapter 1: Transforming Forms of Energy	Chapter 5: This is My Region's Specialty	Chapter 8: Becoming an Environmental Hero
		Chapter 3: This is My Home	Chapter 6: My Role in the School and Community	
		Chapter 4: Climate and Its Changes	Chapter 7: Cultural Diversity and Local Wisdom	
C	Grade V	Chapter 1: Seeing Through Light, Hearing Through Sound	Chapter 5: How We Live and Grow	Chapter 8: Love My Earth, Sad for My Earth
		Chapter 2: Harmony in the Ecosystem	Chapter 6: Indonesia, My Wealthy Nation	
		Chapter 4: Introduction to Our Planet Earth	Chapter 7: My Region, My Pride	
	Grade VI	Chapter 1: How Our Bodies Move	Chapter 3: A Journey Around the World	Chapter 6: Oh No! Is Earth's Energy Really Running Out?
		Chapter 2: Stories About Our Indonesia	Chapter 4: Indonesia and the Global Community	Chapter 7: Our Planet Is in Danger

The results of this mapping indicate that the majority of the elementary IPAS materials in the Merdeka Curriculum have covered key issues relevant to sustainability. These materials address various important sustainability topics that are highly relevant to supporting sustainable development. Purba et al. [8] also highlights that sustainable education should focus on developing knowledge, skills, and values related to social, environmental, and economic sustainability. This demonstrates the curriculum's commitment to sustainable education, which addresses environmental, economic, and social issues in line with the Agenda's guidelines on the importance of integrating education for sustainable development [9]. This can be seen in Table 3, the

analysis results below:

Table 3. ESD analysis result in merdeka curriculum textbooks

No.	Indicator	Phase B		Phase C	
		Grade III	Grade IV	Grade V	Grade VI
1.	Material covers environmental issues (e.g., biodiversity)	✓	✓	✓	✓
2.	Material covers economic issues (e.g., poverty reduction)	✓	✓	✓	✓
3.	Material covers social issues (e.g., gender equality, peace)	✓	✓	✓	✓

Although the IPAS materials in this analysis already support the principles of ESD, there is still room for improvement, particularly in expanding the coverage of global issues and strengthening the connection between local environments and global challenges. This is evident in textbooks that encourage students to conduct simple experiments to assess the environmental impacts on daily life. Yaacob and Abdullah[10] discuss the importance of environmental education in developing sustainable behavior at the elementary school level. However, most materials still focus on local environmental issues, without providing a broader global context as recommended by the sustainable learning approach [11]. Thus, greater efforts are needed to strengthen the connection between local and global knowledge in teaching materials. For example, in Phase B, students are taught about biodiversity through conservation lessons and environmental greening, while several key themes, such as peace and human safety, water crisis prevention, and population migration, are still not adequately represented. In Phase C, the materials begin to introduce students to more complex issues, such as sustainable lifestyles, global peace and safety, and the importance of preventing water crises. This teaching not only provides theoretical understanding but also motivates students to engage in real action.

Materials related to cultural diversity also receive good attention and are integrated into each class. The introduction of local cultural diversity and wisdom not only enriches students' knowledge but also builds awareness of the importance of preserving culture as part of social sustainability. Tobondo [12] also supports this finding by emphasizing the importance of fostering students' awareness of sustainability issues early on through ESD integration across all subjects. However, the discussion of sustainable population migration still needs to be expanded in several classes. For instance, this issue, which should be an integral part of sustainable education, is not fully covered in the analyzed teaching materials, even though it is a key component in achieving Sustainable Development Goal (SDG) 5 [13].

The results of this study have several important implications for future curriculum development. First, there is a need for greater emphasis on integrating social and

economic issues relevant to sustainability. Second, the importance of practical activities at all phases of education to foster deeper problem-solving skills related to sustainability issues [14]. By strengthening the social dimension in ESD, the Merdeka Curriculum can become more comprehensive and relevant in creating a generation ready to face global challenges.

The Merdeka Curriculum offers many opportunities to integrate ESD into elementary IPAS learning, though challenges related to teacher preparedness and competence must be addressed. Research by Waqidah et al.s [15] shows that many elementary school teachers still lack confidence in integrating sustainability concepts into IPAS learning. These findings also underscore the need for further training for educators to integrate ESD more deeply, especially in aspects related to participatory and contextual education. This study shows that although the materials support sustainability, the effectiveness of implementation depends on the quality of teaching and the approaches used. Students must be encouraged to identify sustainability issues, analyze their causes, and develop sustainable solutions as key elements of ESD [16].

4 Conclusion

The analysis of Elementary School IPAS materials in the Merdeka Curriculum reveals efforts to integrate learning with the principles of ESD. This demonstrates that the curriculum has made efforts to contextualize learning with students' everyday lives and local issues. Some positive aspects supporting the implementation of ESD include the integration of sustainability concepts, emphasis on learning, contextualization of local issues, development of 21st-century skills, emphasis on ethics and values, integration of technology and innovation, as well as encouragement for action and participation.

However, there is still room for improvement, especially in expanding the scope of global issues, such as sustainable population migration and water crisis prevention, and strengthening the link between local knowledge and global challenges. These challenges present opportunities to improve the curriculum in the future, making it more comprehensive in supporting sustainability. Additionally, this study emphasizes the importance of developing deeper problem-solving skills through practical activities at all educational phases, as well as the need for enhanced teacher training to integrate sustainability concepts more effectively. Thus, the Merdeka Curriculum can play a crucial role in shaping a generation that is ready to face global challenges in the future. In this way, IPAS learning in elementary schools can serve as a strong foundation for the next generation, equipping them with the attitudes, knowledge, and skills needed to achieve a sustainable future.

Disclosure of Interests.
The authors have no competing interests to declare that are relevant to the content of this article.

References

1. Laurie, R., Nonoyama-Tarumi, Y., Mckeown, R., & Hopkins, C.: Contributions of education for sustainable development (ESD) to quality education, A Synthesis of Research. J. Educ. Sustain. Dev. **10**(2), 226–242 (2016)
2. Fanani, A., Rosidah, C. T., Juniarso, T., Roys, G. A., Putri, E. S., & Vannilia, V.: Bahan ajar digital berbasis multiaplikasi mata pelajaran IPAS SD. J. Pembelajaran, Bimbingan, dan Pengelolaan Pendidik **2**(12), 1175–1183 (2022)
3. Yustiasari, F. L.: Transformasi kurikulum; kecerdasan buatan untuk membangun pendidikan yang relevan di masa depan. J. IHSAN J. Pendidik. Islam **1**(2), 62–71 (2023)
4. Suratmi, S., Santoso, L. M. & Laihat, L.: Development of audiovisual media based on local excellences of south sumatra for science learning. In: Suratmi, S., Santoso, L. M. (eds.) CONFERENCE 2018, ICETeP, vol. 295, pp. 258–262. Atlantis Press, Dordrecht (2019)
5. Wals, A. E. J.: Sustainability by default: Co-creating care and relationality through early childhood education. Int. J. Early Child. **49**(2), 155–164 (2017)
6. Lestari, H., Ali, M., Sopandi, W., & Wulan, A.R.: Integration of sustainable development education into thematic learning in elementary schools. In: AIP Conf. Proc. vol. 2468. AIP, Bandung (2022)

7. Khoiri, N., Hayat, M.S., & Siskawati, D.: Sustainability awareness profile of locational school students through ESD-oriented project-based learning. J. Penelit. Pendidik IPA **9**(Special Issue), 932–938 (2023)
8. Purba, J. T., Budiono, S., Hariandja, E. S., & Pramono, R.: Sustainability strategy to alleviate poverty through education, energy, GRDP, and special funds: evidence from Indonesia. *International Journal of Sustainable Development & Planning*, *18*(5) (2023).
9. McKeown, R., Hopkins, C.: EE p ESD: Defusing the worry. Environ. Educ. Res. **9**(1), 117–128 (2003)
10. Yaacob, A., Abdullah, N.: Environment education for sustainable development (SD) among primary school teachers. Educ. J. Soc. Sci. **9**(2), 35–42 (2023)
11. Taylor, P., Steenmans, K., & Steenmans, I.: Blockchain technology for sustainable waste management. Front. Polit. Sci. **2**(December), 1–5 (2020)
12. Tobondo, Y.A.: Challenges and solutions in the implementation of educational policies in Indonesia: A literature analysis of Merdeka Belajar Kampus Merdeka and teacher reform. EDUKASIA J. Pendidik. dan Pembelajaran **5**(1), 1157–1164 (2024)
13. M Messerli, P., Kim, E. M., Lutz, W., Moatti, J. P., Richardson, K., Saidam, M., ... & Furman, E.: Expansion of sustainability science needed for the SDGs. Nat. Sustain. **2**(10), 892–894 (2019)
14. Kopnina, H., Meijers, F.: Education for sustainable development (ESD): Exploring theoretical and practical challenges. Int. J. Sustain. High. Educ. **15**(2), 188–207 (2014)
15. Waqidah, S.N., Suciati, S., & Ramli, M.: Environmental literacy-based on Adiwiyata predicate at junior high school in Ponorogo. JPBI (J. Pendidik. Biol. Indones.) **6**(3), 405–412 (2020)
16. Parmin, P., & Fibriana, F.: Prospective teachers' scientific literacy through ethnoscience learning integrated with the indigenous knowledge of people in the frontier, outermost, and least developed regions. J. Penelit. dan Pembelajaran IPA **5**(2), 142 (2019)

39. Analysis of Elementary School IPAS Material in Merdeka.pdf

ORIGINALITY REPORT

13%	13%	4%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.atlantis-press.com Internet Source	13%

Exclude quotes	On	Exclude matches	< 4%
Exclude bibliography	On		