

Research Article

Teachers' Perceptions Regarding the Development of Ecotourism-based Science Teaching Materials

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Abstract.

Scientific literacy skills can help students solve the everyday-life problems faced in the twenty-first century. This research aims to explore teachers' perceptions regarding the development of ecotourism-based science teaching materials. The research sample was 21 State Junior School science teachers from across five districts/cities on the island of Lombok. The research instrument is a questionnaire consisting of 10 questions with 4 answer choices (Likert scale), which was adopted from previous research. The collected data were analyzed by finding the percentage of each respondent's answer. The results showed that 86% of respondents thought that it was necessary to integrate the concept of ecotourism into learning and 83% stated that it was necessary to develop ecotourism-based science teaching materials. Complete results related to the need to improve students' scientific literacy skills are presented in the article.

Keywords: teaching materials, ecotourism, scientific literacy

1. INTRODUCTION

One of the skills that students must have in facing the 21st century is scientific literacy skills [1][2]. It is to note that if students have scientific literacy skills they are able to apply the knowledge learned to solve problems in everyday life [2][3][4], as they would be able to analyze an issue and make choices about a phenomenon [5][6]. Unfortunately, the important role and function of scientific literacy is not accompanied by good success as is the reality of what is happening to students today [7][8].

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Referring to PISA (Program for International Student Assessment) (2018), scientific literacy is the ability to use scientific knowledge, identify questions, and draw conclusions based on scientific evidence in order to understand and make decisions regarding nature and its changes due to human activities. PISA reports that Indonesian students have never been out of the top ten at the bottom of the evaluation results from 2006 to 2018 [7]. For example, results of the research show that Indonesian students' literacy skills are still low, namely 29% for content, 34% for process, and 32% for context [9]. In the context of the application of science, it is clear that many students in Indonesia cannot relate the scientific knowledge they learn to phenomena found in everyday life [10][9][11].

The reason behind low scientific literacy abilities of students in Indonesia are many, one of them is the availability of teaching materials that are less suitable for learning. The research results show that appropriate teaching materials could improve scientific literacy skills [12][3][13][2]. It is to underline that teaching materials are a collection of various subject matter used by students in the form of books, videos and audio [14]. These materials will enable students to learn independently, so that they do not only rely on explanation from the teacher [15][16]. Note that a material is said to be good if it can achieve learning targets [17][18].

The main material in science learning is related to the environment. Therefore, science learning that integrates the environment into the learning context is believed to be able to improve the quality of students' scientific literacy. An example of learning scientific literacy through an environmental approach is by taking students to tourist attractions for learning activities, commonly known as ecotourism. Ecotourism is a new form of tourism that takes into account various aspects in its management. The International Ecotourism Society (TIES) defines ecotourism as responsible travel to unspoiled areas to preserve the environment and improve the welfare of local communities. In this context it is necessary to get information regarding teachers' perceptions in developing ecotourism-based teaching materials to increase students' scientific literacy.

2. MATERIALS AND METHODS

This research is a descriptive study, and data collection is conducted in August 2023. The sample is 21 state junior high school science teachers spread across the island of Lombok. The name of the school and number of teachers involved in this survey are presented in Table 1.

TABLE 1: List of schools for data collection.

| School name | Total number of teachers |
|------------------------------|--------------------------|
| SMPN 1 Kayangan Lombok Utara | 2 |
| SMP Negeri 1 Pemenang | 2 |
| SMP Negeri 1 Sikur | 2 |
| SMP Negeri 2 Keruak | 2 |
| SMP Negeri 4 Mataram | 2 |
| SMP Negeri 10 Mataram | 2 |
| SMP Negeri 1 Labuapi | 2 |
| SMP Negeri 4 Sekotong | 2 |
| SMP Negeri 1 Praya Kota | 3 |
| SMP Negeri 2 Kopang | 2 |
| Jumlah Guru | 21 |

The research instrument is a questionnaire adopted from [19] which consists of 10 questions with 4 answer choices (Likert scale) adopted from previous research. The collected data was then analyzed by looking for the percentage of each respondent's answers.

3. RESULTS AND DISCUSSIONS

Data regarding teachers' perceptions in developing ecotourism-based teaching materials was obtained by distributing questionnaires. The results of distributing the questionnaire are shown in Table 2 and Figure 1.

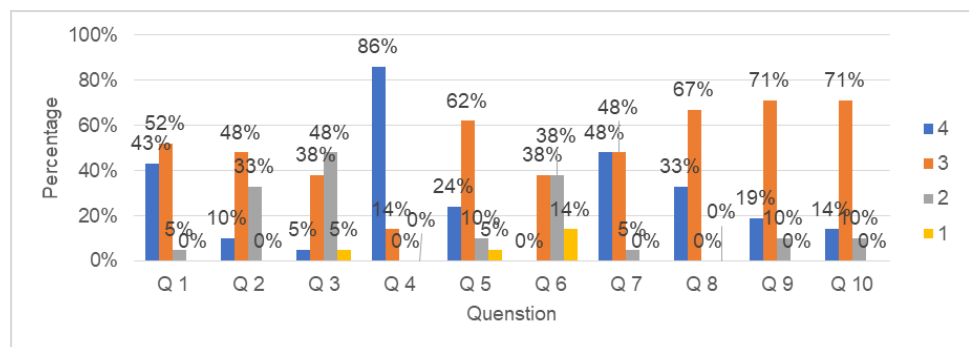


Figure 1: Respondents' answers to each item in the questionnaire.

Teaching materials have an important role in teaching and learning activities. To help teaching and learning activities, educators need teaching materials that help both educators and students; that is, materials that contain all the information, materials

TABLE 2: Respondents' answers to the need in developing ecotourism-based teaching materials.

| Question | Calculated Score | Max Score | % | Caregory |
|--|------------------|-----------|-----|--------------------|
| (Q1) How familiar are you with the term scientific literacy? | 71 | 84 | 85% | Very Familiar |
| (Q2) How well are the teaching materials used at your school to train scientific literacy? | 53 | 84 | 63% | Good |
| (Q3) How often do you evaluate scientific literacy? | 51 | 84 | 61% | Fairly Often |
| (Q4) How necessary do you think it is to develop teaching materials in science learning to increase scientific literacy? | 81 | 84 | 96% | Strongly Needed |
| (Q5) How familiar are you with the term ecotourism? | 64 | 84 | 76% | Fairly Familiar |
| (Q6) How often do you apply lessons related to the concept of ecotourism? | 47 | 84 | 56% | Seldom |
| (Q7) How necessary do you think it is to integrate the concept of ecotourism in learning? | 72 | 84 | 86% | Strongly Necessary |
| (Q8) How important is it to develop ecotourism-based teaching materials? | 70 | 84 | 83% | Very Important |
| (Q9) How practical do you think ecotourism-based teaching materials are in learning? | 65 | 84 | 77% | Quite Potential |
| (Q10) How efficient do you think ecotourism-based teaching materials are in learning? | 64 | 84 | 76% | Quite Potential |

that are prepared in detail, and show complete competence. The function of teaching materials in a learning process is to serve as a guide for educators and students. For educators, teaching materials serve as a guide for directing as well as the meaning of the competencies they must master. Therefore, teaching materials should be prepared coherently and in detail, in order to be used as a benchmark for teachers and students in the learning process.

The success of the learning process is determined by many factors. Teaching materials are an important factor apart from educators, students, facilities and other components[20]. The interaction between these components is very important in achieving the learning goals designed by the teacher. Good teaching materials will be able to motivate students to study harder and be able to develop students' talent [21].

Teaching materials are all forms of materials used to assist teachers/instructors in carrying out teaching and learning activities in the classroom [22]. The material in

question can be written or unwritten material. Teaching materials can also be interpreted as information, tools or texts that are needed or used by teachers to plan and review learning implementation [23][17][24]. Thus, it can be concluded that teaching materials are a set of subject matter that is systematically arranged in accordance with and refers to the applicable curriculum in order to achieve predetermined competency standards and basic competencies. Teaching materials are designed in such a way that takes into account the type, scope, sequence and treatment. The type of learning material also needs to be identified correctly.

Science learning strongly needs innovative teaching materials in the learning process to make it more interesting. One of the science learning teaching materials that can be developed is ecotourism-based teaching materials. Ecotourism concept can provide economic benefits in the form of increasing people's income, positive impacts on the environment in the form of conservation and social benefits in the form of community empowerment in managing ecotourism and increasing community awareness in protecting the environment [25–27]. Ecotourism is often seen as the fastest growing tourism model in the world [28, 29]. Various countries in the world view that ecotourism has great potential to be used as a tool for economic development and environmental protection, especially in developing countries.

The development of ecotourism-based teaching materials is regarded as an innovative teaching material, because apart from teaching students about environment-based science, it can also raise awareness that protecting the environment will have an impact on improving the lives of local communities in the long term (Environmental Services). Thus, it is important to develop ecotourism-based teaching materials. However, to find out how important these teaching materials are, teachers should provide opinions as they have a better understanding of the students' conditions.

Referring to Table 1, State Junior School science teachers on Lombok Island are very familiar with the term scientific literacy. So far, the teachers are very familiar the term scientific literacy and they realize that students' scientific literacy is currently still low. However, the low scientific literacy of students is not accompanied by teachers' efforts to improve it. They argue that they do not have good teaching materials in the learning process. This is evident from the teacher's opinion that the teaching materials that teachers use to improve scientific literacy in schools are ill design.

One of the causes of students' low scientific literacy is that the teaching materials used in learning are in need of improvement. The scientific literacy abilities of students could be improved if they use scientific literacy teaching materials [12]. The low level of students' scientific literacy abilities is influenced by several factors, including teaching

materials that do not meet 21st century learning [3][30]. Thus, it is very important to develop teaching materials so that students can directly experience the application of science in everyday life. This is in accordance with the opinion of respondents, in which 86% of them stated the need to integrate ecotourism concepts in learning and 83% stated the need to develop ecotourism-based science teaching materials.

Table 1 also shows that 77% of respondents stated that the practicality of ecotourism-based teaching materials was quite potential and 76% of respondents stated that the efficiency of ecotourism-based teaching materials was also potential enough to be applied in learning. The detailed teacher's answers to all questions in the questionnaire are presented in Figure 1.

Scientific literacy is an important part that must be achieved in science learning. Scientific literacy has become the main goal in science learning[16] [31]. This is because scientific literacy will make students not only understand concepts in terms of their knowledge. More than that, scientific literacy makes students have scientific competencies and scientific attitudes that can be applied in real life. Apart from having an impact on students, scientific literacy also has an impact on the science learning process as a whole. Science learning carried out by paying attention to scientific literacy will provide more meaningful learning, namely learning that equips students with strengthening scientific concepts and applying them to real, new and different conditions.

Various efforts have been made to provide science learning that sharpens and improves scientific literacy, starting from curriculum development, learning media development, selecting learning strategies, to developing teaching materials. This effort was carried out as a response to the low scientific literacy scores of students in Indonesia in general and on the island of Lombok in particular. Of the many efforts that have been made to increase students' scientific literacy, developing ecotourism-based teaching materials is feasible because Lombok Island has quite big tourism potential to be developed, especially in supporting ecotourism. One of them, Lombok Island, offers marine tourism with stunning beaches and underwater charm. Ecotourism is considered to be a suitable tourism alternative for Lombok Island because apart from developing the tourism sector, the ecotourism concept still pays attention to environmental issues and involves local residents in its development. As a national priority tourism destination, Lombok Island must promote green infrastructure, create conservation areas, and involve local elements in addition to developing the destination.

4. CONCLUSION

Based on the research results, it was concluded that 86% of respondents stated the need to integrate ecotourism concepts in learning and 83% stated the need to develop ecotourism-based science teaching materials. The development of ecotourism-based teaching materials can be used as an innovative teaching material, because apart from teaching students about environment-based science, it can also raise awareness that protecting the environment will have an impact on improving the lives of local communities in the long term (Environmental Services).

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Ethics Policies

Authors declare no conflict of interest.

References

- [1] Zaroha L, Yulia R, Guru Madrasah Ibtidaiyah P, et al. Kemampuan Literasi Sains Siswa Sekolah Dasar di Sekolah Adiwiyata. Studi Dekriptif di SD Adiwiyata X Kota Padang; 2020.
- [2] Pratiwi SN, Cari C, Aminah NS. "Pembelajaran IPA Abad 21 dengan Literasi Sains Siswa.," Jurnal Materi dan Pembelajaran Fisika (JMPF). vol. 9, no. 1, pp. 34–42, 2019.

- [3] S. Agustin, Asrizal, and Festiyed, "Analisis Effect Size Pengaruh Bahan Ajar IPA Bermuatan Literasi Sains Terhadap Hasil Belajar Siswa SMP / MTs Pendahuluan.," *Jurnal IPA dan Pembelajaran IPA*. vol. 5, no. 2, pp. 125–137, 2021.
- [4] Rohmawati E, Widodo W, Agustini R. Membangun Kemampuan Literasi Sains Siswa Melalui Pembelajaran Berkonteks Socio-Scientific Issues Berbantuan Media Weblog. *Jurnal Penelitian Pendidikan IPA*. 2018;3(1):8.
- [5] Valladares L. Scientific Literacy and Social Transformation: Critical Perspectives About Science Participation and Emancipation. *Sci Educ*. 2021;30(3):557–87.
- [6] Fortus D, Lin J, Neumann K, Sadler TD. The role of affect in science literacy for all. *Int J Sci Educ*. 2022;44(4):535–55.
- [7] OECD. PISA 2018 Results COMBINED EXECUTIVE SUMMARIES. Paris: OECD Publishing; 2018.
- [8] Fakhriyah F, Masfuah S. The analysis of scientific argumentation skill and computational thinking skill of the primary educational teacher department students. *AIP Conf Proc*. 2021;2331(1):30005.
- [9] Budiman I, Kaniawati I, Permanasari A, Lukmana I. "Teachers' Perspective on Scientific Literacy in Science Learning: Descriptive Survey," *Jurnal Penelitian Pendidikan IPA*. vol. 7, no. Special Issue SE-Articles & "Special Issue" pp. 218–224, 2021.
- [10] Anshar MA, Rahayu YS, Erman E, Karimah K, Rofiq A. "The Analysis of Umar Masud Junior High School Students' Science Literacy Ability," *Jurnal Penelitian Pendidikan IPA*. vol. 9, no. 2 SE-Articles & "Regular Issue" pp. 926–930, 2023. <https://doi.org/10.29303/jppipa.v9i2.2667>.
- [11] Hidayati H, Ningsi AW, Iskandar AM. Design and Validity of Student Worksheet Integrated Scientific Literacy for The Use of Physics Practicum KIT. *Jurnal Penelitian Pendidikan IPA*. 2023;9(1):384–9.
- [12] Septiani W, Istyadi M, Yulinda R. "Pengembangan Bahan Ajar Berbasis Literasi Sains Pada Topik Interaksi Makhluk Hidup Dengan Lingkungan.," *Jurnal Pendidikan Sains dan Terapan (JPST)*. vol. 1, no. 1, p. 2021.
- [13] Irsan I. "Implemensi Literasi Sains dalam Pembelajaran IPA di Sekolah Dasar.," *Jurnal Basicedu*. p. 2021. <https://doi.org/10.31004/basicedu.v5i6.1682>.
- [14] Farhana F, Suryadi A, Wicaksono D. Pengembangan Bahan Ajar Berbasis Digital Pada Mata Pelajaran Bahasa Inggris Di Smk Atlantis Plus Depok. *Instruksional*. 2021;3(1):1.
- [15] Hasibuan AM, Saragih S, Amry Z. Development of Learning Materials Based on Realistic Mathematics Education to Improve Problem Solving Ability and Student

- Learning Independence. *International Electronic Journal of Mathematics Education*. 2019;14(2):243–52.
- [16] Eviyanti SJ, Ngabekti S, Sumarni W. Effectiveness of Teaching Materials Based on Local Wisdom in the Takalar Region to Improve Literacy Capabilities of High School Students. *Jurnal Penelitian Pendidikan IPA*. 2022;8(6):3089–94.
- [17] Jumadi J, Sunarno W, Aminah NS. “Pengembangan modul IPA berbasis keterampilan proses sains untuk meningkatkan kemampuan berpikir kritis peserta didik kelas VII SMP pada materi kalor.” *INKUIRI: Jurnal Pendidikan IPA*. p. 2018. <https://doi.org/10.20961/inkuiri.v7i2.22986>.
- [18] Rohimajaya NA, Sudirman A, Hamer W. Developing English Materials for the Students of Information System Department at Technology and Information Faculty, Mathlaul Anwar University Banten. *Language Circle: Journal of Language and Literature*. 2021;15(2):241–8.
- [19] Zohri LH, Jufri AW, Sedijani P. Pengembangan Bahan Ajar Berbasis Next Generation Science Standard (NGSS). Terintegrasi Game Discovery Untuk Meningkatkan Literasi Sains Dan Keterampilan Berargumentasi Ilmiah Siswa SMA; 2023.
- [20] Marié DC, Chaparro MA, Irurzun MA, Lavornia JM, Marinelli C, Cepeda R, et al. Magnetic mapping of air pollution in Tandil city (Argentina) using the lichen *Parmotrema pilosum* as biomonitor. *Atmos Pollut Res*. 2016;7(3):513–20.
- [21] Wahyudi A. PENTINGNYA PENGEMBANGAN BAHAN AJAR DALAM PEMBELAJARAN IPS. *JESS: Jurnal Education Social Science*. 2022;2(1):51–61.
- [22] Nuryasana E, Desiningrum N. PENGEMBANGAN BAHAN AJAR STRATEGI BELAJAR MENGAJAR UNTUK MENINGKATKAN MOTIVASI BELAJAR MAHASISWA. *Jurnal Inovasi Penelitian*. 2020;1(5):967–74.
- [23] Minawati Z, Haryani S, Pamelasari SD. “Pengembangan Lembar Kerja Siswa Ipa Terpadu Berbasis Inkuiri Terbimbing Pada Tema Sistem Kehidupan Dalam Tumbuhan Untuk Smp Kelas Viii.” *USEJ - Unnes. Sci Educ J*. 2014;3(3):587–92.
- [24] Caitra ZD. “Pengembangan Perangkat Pembelajaran Model Think Talk Write Subtema Hidup Rukun Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa Kelas V Sekolah Dasar.” *Jurnal Review Pendidikan Dasar: Jurnal Kajian Pendidikan dan Hasil Penelitian*. vol. 5, no. 2, pp. 949–957, 2019. <https://doi.org/10.26740/jrpd.v5n2.p949-957>.
- [25] Wiratno W, Withaningsih S, Gunawan B, Iskandar J. “Ecotourism as a Resource Sharing Strategy: Case Study of Community-Based Ecotourism at the Tangkahan Buffer Zone of Leuser National Park, Langkat District, North Sumatra, Indonesia.” *Sustainability (Switzerland)*. vol. 14, no. 6, p. 2022.

- [26] Harianto SP, Masruri NW, Winarno GD, Tsani MK, Santoso PJ. Development strategy for ecotourism management based on feasibility analysis of tourist attraction objects and perception of visitors and local communities. *Biodiversitas (Surak)*. 2020;21(2):689–98.
- [27] Sukuryadi N. Harahab, M. Primyastanto, and B. Semedi, “Analysis of suitability and carrying capacity of mangrove ecosystem for ecotourism in Lembar Village, West Lombok District, Indonesia.”. *Biodiversitas (Surak)*. 2020;21(2):596–604.
- [28] Sisriany S, Furuya K. Ecotourism policy research trends in Indonesia, Japan, and Australia. *Jurnal Manajemen Hutan Tropika*. 2020;26(2):178–88.
- [29] Nur Syamsi M, Lee JH. “A longitudinal study of the local community perspective on ecotourism development in lombok, indonesia.” *Water (Switzerland)*. vol. 13, no. 17, p. 2021. <https://doi.org/10.3390/w13172398>.
- [30] Irsan I. Irsan, “Implementasi Literasi Sains dalam Pembelajaran IPA di Sekolah Dasar Irsan.”. *Jurnal Basicedu*. 2021;5(6):5631–9.
- [31] Wati F. “Science Literacy: How do High School Students Solve PISA Test Items?” https://api.elsevier.com/content/abstract/scopus_id/85032349476, (2017). <https://doi.org/10.1088/1742-6596/895/1/012166>.