



## Article

# Geography Education for Promoting Sustainability in Indonesia

Nabila Nurul Hawa <sup>1</sup>, Sharifah Zarina Syed Zakaria <sup>1,\*</sup>, Muhammad Rizal Razman <sup>2,\*</sup> and Nuriah Abd Majid <sup>1</sup>

<sup>1</sup> Research Centre for Environment, Economic and Social Sustainability (KASES), Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia, Selangor 43600, Malaysia; nabila.geo@gmail.com (N.N.H.); nuriah@ukm.edu.my (N.A.M.)

<sup>2</sup> Research Centre for Sustainability Science and Governance (SGK), Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia, Bangi 43600, Malaysia

\* Correspondence: szarina@ukm.edu.my (S.Z.S.Z.); mrizal@ukm.edu.my (M.R.R.)

**Abstract:** Education for the environment and sustainable development is the one important thing for being studied. At formal school in Indonesia, it was integrated into the subject matter like social science, natural science, geography, or biology. The study about geography education for promoting sustainability had not been thoroughly done in Indonesia. Therefore, this study examined and investigated articles about geography learning and sustainability in Indonesia from 2010 to 2020. The materials were searched through the Garuda and ERIC application, by using keywords related to geography education. It was selected to published articles in journals indexed by Scopus and Sinta. The data were analyzed by a qualitative method with a content analysis approach. The foci of analysis are topics of sustainability elements, learning methods and models, learning media and resources, and students' assessment in geography learning. All of these were investigated in concern to their relationships and achievements to sustainable development goals (SDGs). As a result, the topics of geography education in Indonesia have contained three main elements of sustainability, namely environment which the most stated, then social, and economic. The learning model and method that was mostly used was outdoor learning with contextual method. The learning media that mostly mentioned were maps, while the learning resources were local wisdom. Aspects of students' assessment that mostly studied in geography education for promoting sustainability were students' knowledge, attitude, and skills. Overall, this study has shown that the topics related to sustainability elements contained in the articles on geography education in Indonesia includes their learning components.

**Keywords:** geography education; geography; sustainability; environment; sustainable development; Indonesia



**Citation:** Hawa, N.N.; Zakaria, S.Z.S.; Razman, M.R.; Majid, N.A. Geography Education for Promoting Sustainability in Indonesia. *Sustainability* **2021**, *13*, 4340. <https://doi.org/10.3390/su13084340>

Academic Editor: Eija Yli-Panula

Received: 1 March 2021

Accepted: 10 April 2021

Published: 13 April 2021

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

Education is one form of an effort to realize Sustainable Development Goals. It also plays an important role in enhancing sustainability and improving human capacity in addressing environmental issues [1]. As stated in the agenda for sustainable development, all students at every level of education have the right to acquire knowledge and skills to promote sustainable development [2]. Indonesia is one of the countries contributing to the success of this agenda [3,4]. Education for promoting sustainability is being an agenda at all levels and subject matters, including geography.

Geography is a discipline that studies the environment includes social and natural sciences [5]. The materials studied in geography consist of various geosphere phenomena that occur on the earth's surface, including their relationships and effects on human life and other living things in spatial dimensions [6]. The main concepts that are often used in geography education are space, area, and the environment, including sustainability. Thus,

integrated learning on social, economic, and environmental topics in sustainability can be achieved through geography education [7].

Studies of the relationship between geography education and sustainability have developed from a discussion of the concept of sustainable development in the geography module [8,9], implementation of sustainability education in the geography curriculum [10], to the perspective of geography teachers on the environment and sustainable development [11–13]. Concepts and materials regarding the environment and sustainable development had been accommodated in geography modules at the secondary and higher education levels [8], but there are still many teachers who do not fully understand the concept [11,12]. Despite the many obstacles and challenges, efforts to integrate environmental education and sustainability education into the geography education curriculum had been made [10].

This is reinforced in the study result that interactive and innovative learning methods were found in the implementation of geography learning to achieve sustainable development goals [9]. However, studies that discuss the implementation of geography learning in a country to promote sustainability, are still limited. Therefore, this study should fill that gap in the research.

This study is a response to the limitations of previous research. Referring to the research conducted by [9], this study aims to investigate the geography learning process in Indonesia to promote SDGs. The investigation includes the topic of sustainability, learning methods, media, and learning resources, as well as the assessment process in learning. The study was conducted with a document analysis approach to research articles on geography education and sustainability in Indonesia.

This study is based on the argument that several elements of the Sustainable Development Goals have been integrated into geography learning in Indonesia, but have not yet covered all of the sustainability elements. This condition was influenced by the components that support the learning process in schools, at the primary, secondary, and higher education levels. The interactive learning models and methods are the aspects that support the success of geography education in promoting sustainability [14]. Also, using learning media has an important role in forming a complete understanding of concepts for students. It also needs to be supported by interesting learning resources to attract and motivate students to take part in learning [15]. Besides the application of appropriate learning methods, resources, and media, another component that is no less important is assessment. This assessment component aims to improve education quality for realizing learning freedom for all students [16]. Thus, the development of geography education in Indonesia is expected to run optimally to achieve sustainable development goals.

## 2. Literature Review

### 2.1. Education and Sustainability Elements

Studies of education and sustainability have developed from the general topic of education for sustainability to the topic of sustainability that was be integrated into certain subjects. Education for sustainability as a single subject is mostly carried out at the level of higher education. This is as studied by Nousheen et al. [17] about the sustainability education course among pre-service teachers' program. The study finding shown that student teachers who studied education for sustainable development during their course work had a more positive attitude towards sustainable development than they did not study it. In another hand, the integrated topic of sustainability into certain subjects has spread on various levels of primary, secondary, and higher education [5,8,9,18–21].

Topics of sustainability contained three elements of environmental sustainability, social sustainability, and economic sustainability [22]. At the primary level, environmental sustainability elements have been covered in science subjects in Malaysia [18]. Those materials were important to equip students for understanding the environmental conditions around them. In Australia, topics of sustainability were also covered within geography from the primary to secondary school levels [23]. Efforts to integrate sustainability topics

in that lessons are expected to realize the understanding of the role and importance of balancing social, economic, and environmental elements of sustainability for students. Besides, the other study discussed sustainability elements integrated on chemistry subject among students of pre-university program in Malaysia [19]. The study finding has shown that all three elements of sustainability have been included in the chemistry subject although the topics of economic and social sustainability were not more than 2.5% and 13%. Education for sustainability whether it stands as a single subject or integrated into certain subjects, affects students' knowledge, attitude, and behavior regarding sustainability in their daily life.

## 2.2. Teaching and Learning Components for Promoting Sustainability

Among the important components in education for promoting sustainability is using learning methods and models appropriately. Different and interactive teaching and learning methods have been used in geography education to promote sustainability [9]. The previous study revealed that outdoor study was a more efficient teaching and learning model than indoor study [24]. The findings of Jeronen et al. [20] have shown that outdoor study through the combining of fieldwork and problem-based learning methods can improve students' knowledge of sustainability. Outdoor education is a very effective medium in teaching students about their environment, because it makes the real world a space for learning [25].

In addition to teaching and learning methods, the media used also influences students' learning achievement. The use of collaborative learning methods and media is needed to develop future educational activities [26]. The learning stages by using media according to Bruner [27] could be started by direct experience (enactive), visual representation in the form of images (iconic), and abstract (symbolic). Media that was completed with various learning resources aims to aid the teaching and learning process to be more effective [15].

The other important components in the teaching and learning process are evaluation and assessment. Students' assessment is a part of the evaluation in curriculum, besides the teacher, subject matter, and milieu assessment [28]. Student assessment has purposed to find out the extent of learning effectiveness between students and teachers (formative) and to examine the students' achievement towards the learning goals (summative) [29]. The assessment techniques can be conducted by observing, recording, informal interviewing, or testing students to understand the change of their knowledge, attitudes, and behavior along the learning process [28]. Furthermore, assessment of students' action and thinking skills also need to be developed and improved in learning practices [29].

## 3. Research Questions

One of the main aims of geography education is to promote sustainability. This study aims to investigate the geography learning process in Indonesia for promoting sustainability. Results of this study are expected to be a reference in curriculum development and learning implementation as a whole.

The formulation of the questions in this study are:

RQ1: What are the sustainability elements contained in the articles on geography education in Indonesia?

RQ2: What are the learning methods and models used in geography education to achieve Sustainable Development Goals in Indonesia?

RQ3: What are the learning media and resources used in geography learning regarding SDGs in Indonesia?

RQ 4: What are the students' assessment aspects in geography learning in Indonesia?

## 4. Materials and Methods

### 4.1. Data Collection

The data collection method used in this study was modified from the method used by Yli-Panula et al. [9]. Articles for the study and analysis were sourced from scientific

databases, such as ERIC (Education Resources Information Center) and Garuda (Garba Rujukan Digital). ERIC is an online digital library of education research sponsored by the Institute of Education Sciences of the United States Department of Education. Meanwhile, the Garuda is an online digital library of research articles/journals sponsored by the Ministry of Research and Technology/National Agency for Research and Innovation, Indonesia. The searching process was conducted in December 2020. All searches were done in English and the Indonesian language. The search strategy was based on the systematic categorization of keywords. The words used in searching concerning the themes were geography education, geography learning, sustainability, and Indonesia. Furthermore, the search has proceeded manually to the articles that appear in the search results.

Initial searches carried out through scientific databases yielded 2175 articles in total, 25 of which were selected for further review. Of the 25 articles, only 15 articles met the criteria for analysis. The criteria used in selecting articles for analysis refer to previous research conducted by [9]. The criteria used in this study are:

1. Scope: articles of study results in Indonesia that published in local and international journals;
2. Type of research: research about geography learning and sustainability in Indonesia;
3. Period: 2010–2020;
4. Target groups: learning processes in primary schools, secondary schools, and higher education;
5. Language: English and Indonesian;
6. Quality: academic papers were indexed by Scopus (for international research) and Sinta (for local research).

Some of the articles were rejected because they were not research results, did not contain sustainability elements, and did not specifically study geography learning but social science. The journal and articles selected for analysis according to the above criteria are presented in Table 1:

**Table 1.** Journals of the analyzed articles and the target groups.

Journal	Article Number	Indexed By	Group Level
International Journal of Instruction	[30,31]	Scopus Q2	S, H
Journal of Social Studies Education Research	[32]	Scopus Q2	S
Review of International Geographical Education Online	[33]	Scopus Q3	S
Cakrawala Pendidikan	[34]	Scopus Q3 & Sinta 1	H
Jurnal Geografi: Media Informasi Pengembangan dan Profesi Kegeografian	[35]	Sinta 4	H
Forum Ilmu Sosial	[36]	Sinta 4	H
Jurnal Kepemimpinan dan Pengurusan Sekolah	[37]	Sinta 4	H
Jurnal Pendidikan Geografi	[38,39]	Sinta 3	H, P
Spatial: Wahana Komunikasi dan Informasi Geografi	[40]	Sinta 4	H
Edu Geography	[41,42]	Sinta 5	S, S
Jurnal Pendidikan Humaniora	[43]	Sinta 3	H

Notes: P = primary; S = secondary; H = higher education.

#### 4.2. Data Analysis

This study used a qualitative method with a content analysis approach [44]. It was conducted by steps: preparing and processing data, reading data to get an in-depth understanding, giving code to the sentences or paragraphs in data, categorizing data, describing and restating data, and interpreting data [45]. Preparing and processing data was done by identifying the characteristics and background of selected articles. Then the continuous reading step was carried out to get an in-depth understanding of the contents of the articles. This process was also followed by coding the text. Next, the obtained data were grouped by theme and restated as a data description. Furthermore, data were being interpreted and related to the previous studies.

The analysis stage in this study refers to the previous study [9]. Data analysis was started to identify the topics of sustainability elements, learning methods and models, learning media and resources, and students' assessment contained in the all of the articles. Then, the coding process was done manually by using Nvivo 12 plus software. The codes obtained were used as the basis for categorization and classification.

To answer the RQ1, some classification expressions were determined based on the UN's definitions of 17 Sustainable Development Goals [2]. This was intended to get a categorization that follows the topic of sustainability elements. Classification of SDGs subcategories and main categories are presented in Table 2:

**Table 2.** Subcategories and main categories of Sustainable Development Goals (SDGs).

Subcategory	Main Category
Goal 1. No poverty	Economic
Goal 2. Zero hunger	Economic
Goal 3. Good health and well-being	Economic
Goal 4. Quality education	Social
Goal 5. Gender quality	Social
Goal 6. Clean water and sanitation	Environmental
Goal 7. Affordable and clean energy	Environmental
Goal 8. Decent work and economic growth	Economic
Goal 9. Industry, innovation, and infrastructure	Economic
Goal 10. Reduced inequalities	Social
Goal 11. Sustainable cities and communities	Social
Goal 12. Responsible consumption and production	Environmental
Goal 13. Climate action	Environmental
Goal 14. Life below water	Environmental
Goal 15. Life on land	Environmental
Goal 16. Peace, justice, and strong institutions	Social
Goal 17. Partnership for the goals	Social

Meanwhile, categories that formed based on the expressions or codes found were to answer RQ 2, 3, and 4. The categories were then classified into themes based on research questions.

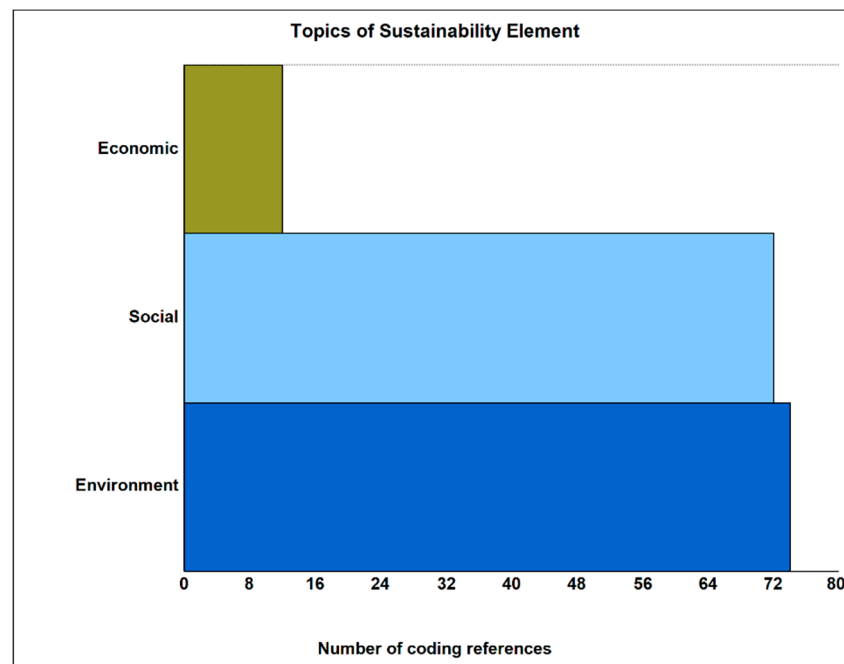
## 5. Results

The results of this study indicate that geography education has played an important role in promoting elements of the Sustainable Development Goals in Indonesia. Many learning components influence the implementation and success of education at schools. Those components include learning methods and models, learning resources and media used, and learning assessment. Topics of SDGs elements and the three education components will be explained in the following subsection.

### 5.1. Elements of Sustainable Development Goals in the Geography Education in Indonesia

Elements of Sustainable Development Goals had been included in 15 articles on geography education in Indonesia (Table A1 in Appendix A). From the data reading results, there were 31 codes with 158 coding references regarding the sustainability elements. The elements included environmental sustainability, social sustainability, and economic sustainability (Figure 1).

The elements of environmental sustainability were included in 13 articles with 13 total codes and 74 coding references. The most common codes found were natural resources on land, environmental sustainability, and water resources. Meanwhile, codes of environmental degradation, reuse and recycle, were the least found in the articles. The other topics also found are climate change, conservation, disaster, energy, pollution, waste management, physical geography, and geosphere phenomena.



**Figure 1.** Number of coding references in the topics of sustainability elements.

The elements of social sustainability were included in 14 articles with 13 total codes and 72 coding references. The codes found with the greatest number were education, social condition, and culture. Meanwhile, the least codes found were reduced inequalities, a good governance system, and the development of the country. The topics of social sustainability such as community, population, problems in rural and urban areas, and sustainable communities were also found in the articles analyzed.

The least element of sustainability found was economy, only in five articles. The number of codes regarding economic sustainability is five, with 12 coding references. Industry, innovation, and infrastructure were mostly found. Otherwise, health and poverty were the least found. The other codes included in economic sustainability were well-being, transportation, and technology.

### 5.2. Geography Learning Models and Methods to Achieve Sustainable Development Goals in Indonesia

Analysis of geography learning models and methods to promote and achieve sustainable development goals obtained 55 codes. The codes of components in learning methods and models were scattered in 13 articles with different proportions (Table A2 in Appendix A). Meanwhile, the two articles [18,19] did not discuss and mention using of methods and models in learning.

There were four learning models found in geography education articles to support the achievement of SDGs (Figure 2), namely outdoor learning, indoor and outdoor learning, field study, and self-learning. Of the 23 coding references regarding learning models, the most as an outdoor learning model. It was mentioned 12 times. While the least was self-learning, that was mentioned twice.

Codes on learning methods in geography education to support the achievement of SDGs appeared as many as 32 references (Figure 3). The most mentioned method was contextual learning, which was mentioned 10 times. The least popular methods were cooperative learning, inquiry learning, storytelling, and project-based learning. The other learning methods were discussions, tutorials, interactive learning, conventional learning, experiential learning, and problem-based learning.

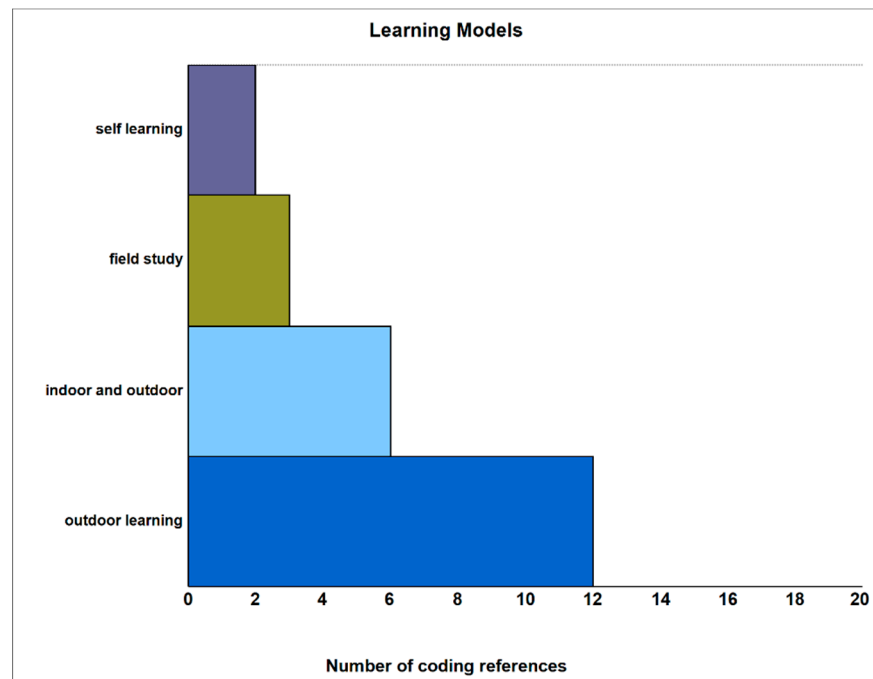


Figure 2. Number of coding references in learning models to achieve SDGs.

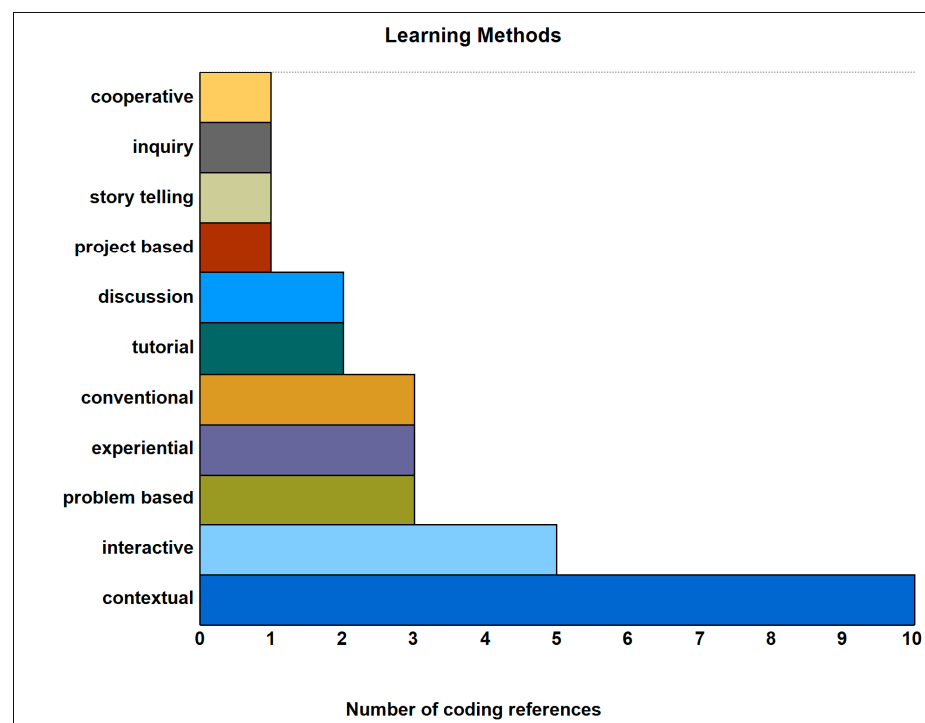


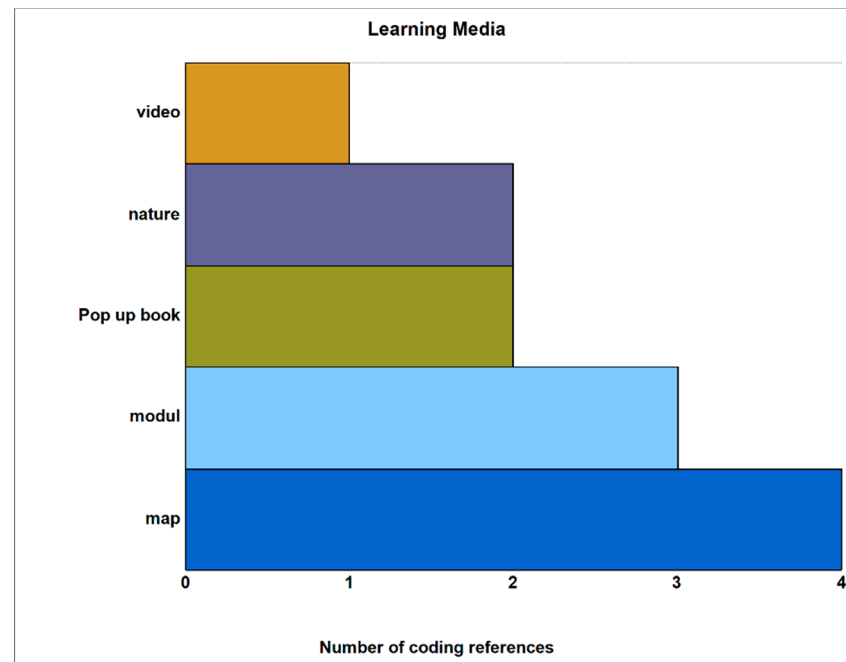
Figure 3. Number of coding references in learning methods to achieve SDGs.

### 5.3. Geography Learning Media and Resources Regarding the Elements of Sustainability

Learning media and resources about sustainability elements in geography education were obtained variously. In the data analysis, codes of learning media and resources were found in 13 articles (Table A3 in Appendix A) with 40 coding references. Meanwhile, two articles do not specifically mention media and learning resources, namely [34].

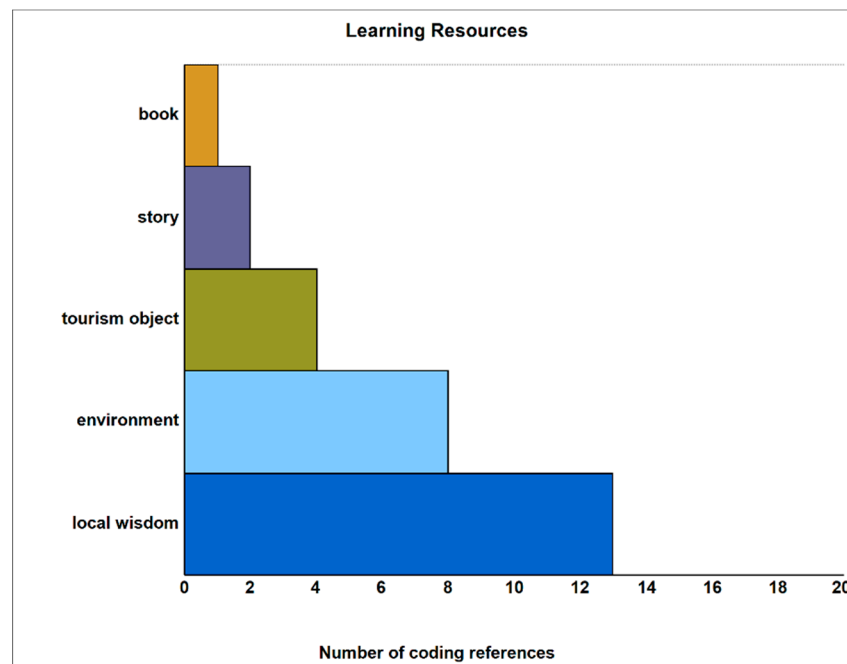
Five kinds of learning media mentioned 12 times. The learning media were in the form of video, nature, pop-up books, modules, and maps (Figure 4). The most mentioned

learning media was the map. While the video was the least mentioned.



**Figure 4.** Number of coding references in learning media regarding materials of SDGs.

Meanwhile, geography learning resources regarding materials of SDGs were mentioned in 11 articles with 28 coding references (Figure 5). Local wisdom as a geography learning resource was the most mentioned. While the least mentioned learning resource was the book. Furthermore, the other learning resources found were story, tourism object, and the environment.



**Figure 5.** Number of coding references in learning resources regarding materials of SDGs.

#### 5.4. Students' Learning Assessment of Geography Learning in Indonesia

The learning assessment aspects were contained 15 articles (Table A4 in Appendix A).



However, the proportion of the assessment aspects mentioned in each article was different. There were seven aspects of student assessment mentioned where students' knowledge is the most popular with 14 times mentioned (Figure 6). The next aspect of the assessment was the student's skills, which were mentioned 13 times. The students' awareness was the least mentioned five times. Meanwhile, other aspects of the assessment also mentioned in the articles were students' behavior, students' activity, students' attitude, and students' thinking skills.

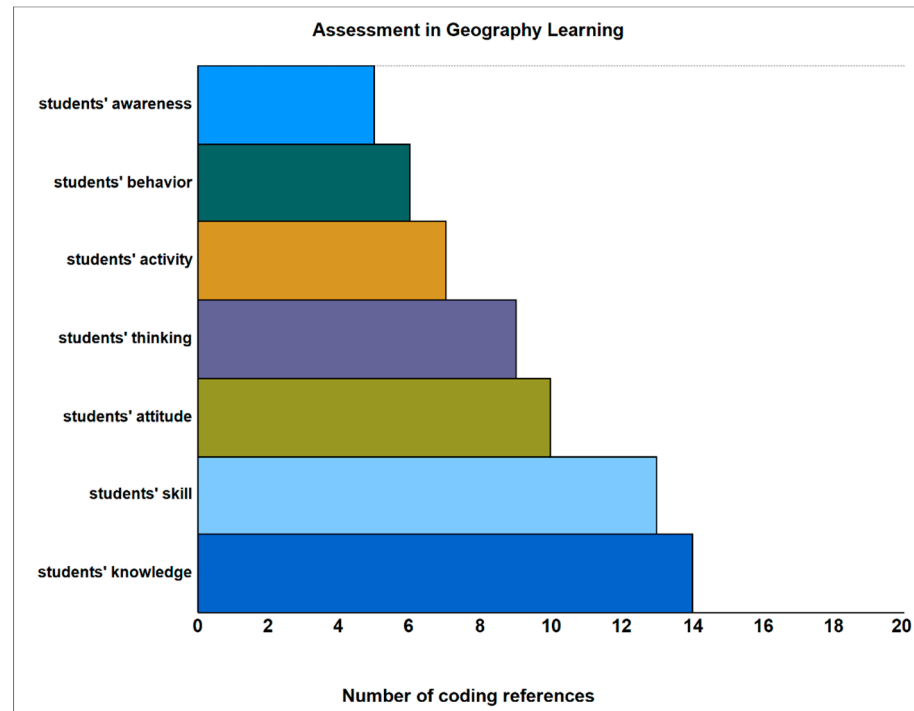


Figure 6. Students' assessment in geography education.

## 6. Discussion

The findings results showed that almost all articles analyzed have contained elements of social and environmental sustainability. These findings reinforce the fact that there is scope in the topic of geography studies covering social geography and physical geography [46]. Social or human geography that includes the anthroposphere is closely related to the topic of social sustainability. This topic aims to shape educated people who can face challenges in society and community [47]. While the physical geography that includes lithosphere, hydrosphere, atmosphere, and biosphere materials, is closely related to environmental sustainability. This is following the findings of the study [35] stated that the topics of physical geography involved in the study of sustainability include climate change, loss of biodiversity, water resources, pollution, and land degradation. Meanwhile, the element of economic sustainability was found to be no less in 5 articles of the 15 articles analyzed. The overall findings on the topic of this study reflect the alignment between topics in geography education and sustainable development goals

These findings are similar to the previous study [9] with different expression components. The previous study revealed that environmental sustainability was detected by finding most expressions finding such as climate change and groundwater. Meanwhile, this study found that natural resources in land and water resources were the most popular elements in environmental sustainability. In the elements of social sustainability, Yli-Panula et al. [9] stated that gender equality and sustainable lifestyle were the most found topics. Meanwhile, in this study, the elements of social sustainability were mostly shown through codes of education, social condition, population, and sustainable communities.

This is motivated by the topic preference of social conditions discussed in geography education articles in Indonesia are to the quality of education and learning, subject matter in the form of population phenomena that occur at the local level, rural area, urban area, and efforts to integrate local wisdom into learning [48,49].

Topics and materials in geography education need to be conveyed by teachers to students with appropriate teaching models and methods. In the data analysis, it was found that the most models were outdoor learning, indoor-outdoor learning, field study, and self-learning. In the outdoor learning model, one of the most common methods is the contextual learning method. This method allows students to get information and knowledge directly from the occurred phenomena [50], so it can increase the student activity in learning [51]. In geography, the contextual learning method is needed so that students can behave more wisely and care about their environment [52]. An example of using this method is student observation of the characteristics of Mount Galunggung in morphology learning [40].

The second highest learning methods used in geography education for promoting sustainability in Indonesia were problem-based learning, that found in 3 of 15 articles, then interactive, discussion, and experiential learning that found in two articles. These findings are a little different from the Yli-Panula's et al. [9] which stated that interactive was the most popular method. In the case of geography education in Indonesia, the interactive learning method was only found on secondary level [30] and higher education [31]. This method is used specifically to build active communication between teachers and students in the learning process, experiment, observation, and discussion.

The least popular using learning methods were cooperative, inquiry, project-based learning, storytelling, and tutorial method. The use of cooperative, inquiry, and project-based learning methods in this study was different from the study finding of [9]. The cooperative method is implemented by forming small groups that will help each other in the learning process [53]. Whereas, a similar method that was mostly used in this study is the discussion, with the teacher's role and guidance as a facilitator. This is a similar case with the project-based learning method, which is used less frequently than problem-based learning. This result is consistent with the finding of [54] which stated that the implementation of geography learning in Indonesia was more oriented to problems that occur in the surrounding environment than through project-based learning. Likewise, the inquiry method should be enhancing the students' spirit and creativity in learning some environmental and ecological issues [55]. The other method that was also least used is storytelling. This is similar to the finding of [9], which this method should be able to add the emotional experience and in-depth understanding for students. One of the article that studied stated that the storytelling method combined with pop-up book media was used to teach a topic about landslide disaster mitigation to preschool students, and the result was that students become more interested in learning so it was easier to understand the process of disasters and the mitigation actions [39].

According to Bruner [27], there are three main levels of learning resources, namely direct experience (enactive), visual representation in the form of images (iconic), and abstract (symbolic). Enactive helps students in learning and understanding concrete materials. The finding of this study showed that the most popular learning resources were enactive such as the environment, local wisdom, and tourism object. The other learning resources were books and stories. Meanwhile, the implementation of learning resources was conveyed by teachers through the learning media, such as a map, pop-up book, and video. The use of enactive learning resources in this study is different from the findings [56] which stated that the learning resources found used in teaching geography in secondary schools in County, Kenya, are teaching notes, charts, and maps. To promote sustainability, direct experience learning can increase students' knowledge and sensitivity to understand the phenomena that occurred around them, both in the environmental, social, and economic aspects.

Besides the use of learning methods and resources in geography education, the assessment aspect also deserves attention in the promotion of sustainability. Assessment is an

important aspect in realizing quality education, which is included in the fourth SDG. In this study findings, it was known that the most common aspects of students' assessment are knowledge, attitude, and skills. Knowledge and attitude are related to each other according to the theory of behavioral change model [57], that knowledge becomes the basis for shaping a person's attitude, which if continued will influence practice and behavior [58]. Nevertheless, the assessment of behavior aspect in this study was quite limited, so there is no visible correlation and relationship among those aspects of the assessment. However, complete assessments can be found in four articles containing aspects of knowledge, skills, attitudes, awareness, and behavior [30,33,36,37].

## 7. Conclusions

Overall, this study can show the sustainability elements contained in the geography education articles in Indonesia. It also includes some learning components of methods and models, learning media and resources, and learning assessment. However, this study had limitations that did not further examine the three components' relations in promoting sustainability. This study also was limited to the geography subject in Indonesia and not being researched in other countries. Whereas studies on more subject matters such as biology, mathematics, natural science, and social science subjects in Indonesia and other countries also are required for promoting sustainability on the whole. Therefore, this study encourages the implementation of further studies to examine the issues. Besides, this study also recommends teachers of geography and other subjects for giving more attention to the learning components that support efforts to achieve sustainability. Recommendations are also given to the governments, especially the Indonesia Ministry of Education, to develop curriculum standards under the sustainability principles.

**Author Contributions:** Conceptualization, analysis and methodology, N.N.H.; Supervision: S.Z.S.Z. and N.A.M.; Writing—original draft, N.N.H.; Writing—review and editing, S.Z.S.Z., M.R.R. and N.A.M.; Funding acquisition: M.R.R. All authors have read and agreed to the published version of the manuscript.

**Funding:** The APC was funded by Universiti Kebangsaan Malaysia (UKM).

**Data Availability Statement:** Not applicable.

**Acknowledgments:** This research was funded by Universiti Kebangsaan Malaysia (UKM) for the financial support through research grants, Dana Pecutan Penerbitan—LESTARI UKM: PP/LESTARI/2021, XX-2018-008 and XX-2020-010. The authors are very thankful to the Institute for Environment & Development (LESTARI), Universiti Kebangsaan Malaysia (UKM) for providing facilities to conduct the research.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

Table A1. Sustainability elements covered in the 15 articles analyzed.

Sustainability Element	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[52]
<b>Economic</b>	x		x				x				x				x
1. Industry, innovation, & infrastructure	x		x				x								
2. Health							x								
3. Well-being							x								x
4. Transportation & technology	x										x				
5. Poverty							x								
<b>Social</b>	x	x	x	x	x	x	x	x		x	x	x	x	x	x
1. Population			x	x			x								
2. Community	x							x			x		x	x	x
3. Sustainable communities											x			x	
4. Culture											x			x	x
5. Reduce inequalities														x	
6. Social condition	x	x		x							x			x	
7. Development in country				x											
8. Problems in the city	x		x				x								
9. Good governance															x
10. Education		x	x	x	x	x	x	x			x	x	x		x
11. Environmental education										x					x
12. Geography education		x		x								x			
13. Effective learning										x		x			
<b>Environment</b>	x		x	x		x	x	x	x	x	x	x	x	x	x
1. Conservation						x	x				x			x	x
2. Climate change	x					x									
3. Water resources	x						x		x						x
4. Energy	x						x								
5. Disaster			x							x	x			x	x
6. Waste management							x	x							
7. Reuse and recycle							x								
8. Pollution	x						x								
9. Natural resources in land	x		x	x							x		x	x	x
10. Environmental degradation															x
11. Environmental sustainability	x			x			x				x			x	x
12. Geosphere			x								x				
13. Physical geography				x							x	x			

Table A2. Learning models and methods mentioned in the 13 of 15 articles analyzed.

		[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[52]
Learning models	self-learning					x										
	Field study			x								x				
	Indoor & outdoor		x	x			x	x		x	x		x	x		
	outdoor		x	x			x		x	x		x	x	x		
Learning methods	Cooperative inquiry		x				x									
	Project based		x													
	Story telling										x					
	Discussion					x								x		
	Tutorial					x										
	Conventional		x						x							
	Experiential								x	x						
	Problem based		x			x			x							
Interactive contextual		x	x				x	x			x	x		x	x	

**Table A3.** Learning media and sources mentioned in the 13 of 15 articles analyzed.

		[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[52]
Learning Media	Video								x							
	Nature								x	x						
	Pop-up book module map				x				x		x					x
Learning Sources	Book				x											
	Story										x					
	Tourism object											x	x			
	Environment			x			x	x	x			x		x		
	Local wisdom	x										x	x		x	x

**Table A4.** Students' assessment of geography learning mentioned in the 15 articles analyzed.

Students' Assessment	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[52]
Awareness					x		x	x							x
Behavior	x			x			x								
Activity		x				x				x		x	x		
Thinking skills			x	x											
Attitude	x	x			x	x		x	x						x
Knowledge	x		x	x		x	x	x	x	x		x			
Skills	x	x	x	x				x			x				

## References

- Razak, N.H.B.A.; Iksan, Z.H.; Zakaria, S.Z.S. Students' reflection on green school. *J. Technol. Soc.* **2017**, *9*, 44–52. Available online: <https://publisher.uthm.edu.my/ojs/index.php/JTS/article/view/1765> (accessed on 26 March 2021).
- United Nations Transforming Our World: The 2030 Agenda for Sustainable Development. A/RES/70/1 2015. Available online: [https://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E). (accessed on 24 December 2020).
- Yusuf, G. Integrating SDGs to Development Plan. 201. Ministry of National Development Planning (Bappenas). Republic Indonesia. Available online: <https://www.slideshare.net/UNDPasiapacific/integrating-sdgs-to-development-plan> (accessed on 17 December 2020).
- Ministry of Education and Culture of Indonesia Republic. Peta Jalan Generasi Emas Indonesia 2045. 2017. Available online: <https://paska.kemdikbud.go.id/wp-content/uploads/2018/08/170822-V.2-Generasi-Emas-2045-.pdf> (accessed on 24 December 2020).
- Meadows, M. Geography Education for Sustainable Development. *Geogr. Sustain.* **2020**, *1*, 88–92. [CrossRef]
- Commision of Geographical Education. 2016 International Charter on Geographical Education. 2016. Available online: [https://www.igu-cge.org/wp-content/uploads/2019/03/IGU\\_2016\\_eng\\_ver25Feb2019.pdf](https://www.igu-cge.org/wp-content/uploads/2019/03/IGU_2016_eng_ver25Feb2019.pdf) (accessed on 9 November 2020).
- Skarstein, F.; Wolff, L.A. An issue of scale: The challenge of time, space and multitude in sustainability and geography education. *Educ. Sci.* **2020**, *10*, 28. [CrossRef]
- Sprenger, S.; Nienaber, B. (Education for) Sustainable Development in Geography Education: Review and outlook from a perspective of Germany. *J. Geogr. High. Educ.* **2018**, *42*, 157–173. [CrossRef]
- Yli-Panula, E.; Jeronen, E.; Lemmetty, P. Teaching and learning methods in geography promoting sustainability. *Educ. Sci.* **2020**, *10*, 5. [CrossRef]
- Dube, C. The Uptake of Education for Sustainable Development in Geography Curricula in South African Secondary Schools. In *Schooling for Sustainable Development in Africa*; Lotz-Sisitka, H., Shumba, O., Lupele, J., Wilmot, D., Eds.; Springer International Publishing: Cham, Switzerland, 2017; pp. 93–105. ISBN 9783319459875.
- Nguyen, T.P. Education for Sustainable Development in Vietnam: Exploring the geography teachers' perspectives. *Int. Res. Geogr. Environ. Educ.* **2018**, *27*, 341–356. [CrossRef]
- Shaari, M.Z.A.; Osman, S. Malaysian geography teachers' knowledge about environmental Concepts. *Procedia Soc. Behav. Sci.* **2011**, *19*, 434–442. [CrossRef]
- Hanifah, M.; Mohmadisa, H.; Yazid, S.; Nasir, N.; Balkhis, N.S. Professional and pedagogical competencies of geography teachers in Malaysia. *Rev. Int. Geogr. Educ. Online* **2019**, *9*, 304–318. [CrossRef]
- Widener, J.; Gliedt, T.; Tziganuk, A. Assessing Sustainability Teaching and Learning in Geography Education. *Int. J. Sustain. High. Educ.* **2016**, *17*. [CrossRef]
- Bušljeta, R. Effective Use of Teaching and Learning Resources. *Czech-Polish Hist. Pedagog. J.* **2013**, *5*, 55–69. [CrossRef]
- Makarim, N. Kebijakan Asesmen Nasional. Available online: <https://youtu.be/3xOFTaBXRno>. (accessed on 15 February 2021).

17. Nousheen, A.; Yousuf Zai, S.A.; Waseem, M.; Khan, S.A. Education for sustainable development (ESD): Effects of sustainability education on pre-service teachers' attitude towards sustainable development (SD). *J. Clean. Prod.* **2020**, *250*, 119537. [CrossRef]
18. Zakaria, S.Z.S. Science Education in Primary School towards Environmental Sustainability. *Res. J. Appl. Sci.* **2011**, *6*, 330–334.
19. Kanapathy, S.; Lee, K.E.; Sivapalan, S.; Mokhtar, M.; Syed Zakaria, S.Z.; Mohd Zahidi, A. Sustainable development concept in the chemistry curriculum: An exploration of foundation students' perspective. *Int. J. Sustain. High. Educ.* **2019**, *20*, 2–22. [CrossRef]
20. Jeronen, E.; Palmberg, I.; Yli-Panula, E. Teaching methods in biology education and sustainability education including outdoor education for promoting sustainability—A literature review. *Educ. Sci.* **2016**, *7*, 1. [CrossRef]
21. Aminrad, Z.; Sayed Zakariya, S.Z.B.; Samad Hadi, A.; Sakari, M. Relationship between awareness, knowledge and attitudes towards environmental education among secondary school students in Malaysia. *World Appl. Sci. J.* **2013**, *22*, 1326–1333. [CrossRef]
22. Purvis, B.; Mao, Y.; Robinson, D. Three pillars of sustainability: In search of conceptual origins. *Sustain. Sci.* **2019**, *14*, 681–695. [CrossRef]
23. Maude, A. Sustainability in the Australian Curriculum: Geography. *Geogr. Educ.* **2014**, *27*, 19–27.
24. Palmberg, I.; Kärkkäinen, S.; Jeronen, E.; Yli-Panula, E.; Persson, C. Nordic student teachers' views on the most efficient teaching and learning methods for species and species identification. *Sustainability* **2019**, *11*, 5231. [CrossRef]
25. Abdullah, A.; Zakaria, S.Z.S.; Razman, M.R. Environmental education through outdoor education for primary school children. *Int. J. Malay World Civilis.* **2018**, *6*, 27–34. [CrossRef]
26. García, A.C.; Gil-Mediavilla, M.; Álvarez, I.; Casares, M.d.l.Á. The influence of social networks within educational and social fields: A comparative study between two generations of online students. *Sustainability* **2020**, *12*, 9941. [CrossRef]
27. Bruner, J.S. *Toward a Theory of Instruction*; Harvard University: Cambridge, UK, 1966.
28. Marsh, C.J.; Willis, G. *Curriculum: Alternative Approaches, Ongoing Issues 4*, 4th ed.; Stollenwerk, D.A., Ed.; Pearson Education: Upper Saddle River, NJ, USA, 2007; ISBN 0-13-171510-0.
29. Amua-Sekyi, E.T. Assessment, Student Learning and Classroom Practice: A Review. *J. Educ. Pract.* **2016**, *7*, 1–6.
30. Aliman, M.; Budijanto; Sumarmi; Astina, I.K. Improving environmental awareness of high school students' in Malang city through earthcomm learning in the geography class. *Int. J. Instr.* **2019**, *12*, 79–94. [CrossRef]
31. Munandar, A.; Maryani, E.; Rohmat, D.; Ruhimat, M. Establishing the professionalism of geography teacher through authentic assessment field study. *Int. J. Instr.* **2020**, *13*, 797–818. [CrossRef]
32. Ridha, S.; Utaya, S.; Bachri, S.; Handoyo, B. Students' geographic skills in indonesia: Evaluating GIS learning material questions using taxonomy of spatial thinking. *J. Soc. Stud. Educ. Res.* **2019**, *10*, 266–287.
33. Nursa'Ban, M.; Kumaidi, K.; Mukminan, M. Factors of critical spatial thinking for a geography metacognition assessment in indonesian senior high schools. *Rev. Int. Geogr. Educ. Online* **2020**, *10*, 186–204. [CrossRef]
34. Nursa'ban, M. Peningkatan Sikap Tanggung Jawab Dan Kemandirian Belajar Mahasiswa Melalui Metode Tutorial Di Jurusan Pendidikan Geografi. *J. Cakrawala Pendidik.* **2013**, *3*, 432–443. [CrossRef]
35. Sriyono Penerapan Green Campus for My City sebagai Model Pembelajaran Kontekstual Pada Mata Kuliah Pendidikan Lingkungan Hidup (PLH) untuk Meningkatkan Afeksi Mahasiswa Jurusan Geografi FIS UNNES dalam Mewujudkan Konservasi Alam. *J. Geogr. Media Inf. Pengemb. Profesi Kegeografian* **2011**, *8*, 1–10. [CrossRef]
36. Sari, S.N. Kontribusi Mahasiswa Jurusan Geografi Universitas Ivet Di Semarang Dalam Pelestarian (Konservasi) Lingkungan Kampus. *Forum Ilmu Sos.* **2019**, *46*, 154–164. [CrossRef]
37. Andini, N.F. Pengaruh Pembelajaran Outdoor Study Terhadap Sikap Kepedulian Lingkungan Bagi Mahasiswa S1. *J. Kepemimp. Pengur. Sekol.* **2018**, *3*, 109–118.
38. Purnomo, A. Pengaruh Pembelajaran Outdoor terhadap Pengetahuan dan Sikap Pelestarian Lingkungan Mahasiswa S1 Pendidikan Geografi Universitas Kanjuruhan Malang. *J. Pendidik. Geogr.* **2015**, *20*, 37–47. [CrossRef]
39. Bernardi, A.I. Pendidikan Kesiapsiagaan Bencana Tanah Longsor Untuk Siswa Anak Usia Dini Dengan Metode Dongeng Berbasis Media Pop Up Book Di Paud Dewi Sartika Kecamatan Bergas. *J. Pendidik. Geogr.* **2018**, *23*, 85–93. [CrossRef]
40. As'ari, R.; Mulyanie, E. The use of local landscape as a field laboratory for geography of education. *Spat. Wahana Komun. Inf. Geogr.* **2019**, *19*, 1–7. [CrossRef]
41. Rustam, S.; Santoso, A.B. Penerapan metode outdoor study pada pembelajaran geografi kelas X Ips Ma Al Bidayah kecamatan bandungan kabupaten semarang tahun 2014/2015. *Edu Geogr.* **2015**, *3*, 72–79.
42. Hayani, S.; Santoso, A.B. Pemanfaatan Lingkungan sebagai Sumber Belajar Outdoor Study pada Mata Pelajaran Geografi Materi Lingkungan Hidup Kelas XI-IPS di SMA Negeri Se-Kabupaten Pekalongan. *Edu Geogr.* **2015**, *3*, 27–33.
43. Sukmawati; Utaya, S.; Susilo, S. Kearifan lokal masyarakat adat dalam pelestarian hutan sebagai sumber belajar geografi. *J. Pendidik. Hum.* **2015**, *3*, 202–208.
44. Elo, S.; Kyngäs, H. The qualitative content analysis process. *J. Adv. Nurs.* **2008**, *62*, 107–115. [CrossRef] [PubMed]
45. Creswell, J.W. *Research Design Qualitative, Quantitative, and Mixed Method Approaches*, 3rd ed.; SAGE Publication: Los Angeles, CA, USA, 2009; ISBN 0-7619-0070-5.
46. Kariel, H.G. Scope of Geographic Study. *J. Geog.* **1967**, *66*, 150–154. [CrossRef]
47. Saroha, J. Scope and Contemporary Relevance of Human Geography. *Int. J. Res. Anal. Rev.* **2018**, *5*, 129–134. Available online: [http://ijrar.com/upload\\_issue/ijrar\\_issue\\_623.pdf](http://ijrar.com/upload_issue/ijrar_issue_623.pdf) (accessed on 17 February 2021).

48. National Education Standard Board. *Fokus Pembelajaran SD/MI, SMP/MTs, SMA/MA [Focuses of Learning in Elementary and Secondary School]*; National Education Standard Board: Jakarta, Indonesia, 2020; ISBN 9786239549404. Available online: <https://bsnp-indonesia.org/wp-content/uploads/2020/11/Fokus-Pembelajaran.pdf> (accessed on 30 January 2021).
49. National Education Standard Board. *Permendikbud No 59 Tahun 2014 Kurikulum 2013 11a Silabus Geo Minat SMA. In Permendikbud No 59 Tahun 2014 Kurikulum 2013*; National Education Standard Board: Jakarta, Indonesia, 2014; pp. 1774–1845. ISBN 9788578110796. Available online: <https://jdih.kemdikbud.go.id/arsip/Permendikbud%20Nomor%2059%20Tahun%202014.pdf> (accessed on 7 February 2021).
50. Lotulung, C.F.; Ibrahim, N.; Tumurang, H. Effectiveness of learning method Contextual Teaching Learning (CTL) for increasing learning outcomes of entrepreneurship education. *Turkish Online J. Educ. Technol. TOJET* **2018**, *17*, 37–46.
51. Kosassy, S.O.; Gistituati, N.; Jama, J.; Montessori, M. The implementation of contextual learning approach in e-learning based on weblog toward students learning achievements. *J. Couns. Educ. Technol.* **2018**, *1*, 59–64. [[CrossRef](#)]
52. Mau, M.H.; Susilo, S.; Ruja, I.N. Kearifan Lokal Upacara an Tama Masyarakat Adat Loona sebagai Sumber Belajar Geografi. *J. Pendidik. Teor. Penelit. Pengemb.* **2019**, *4*, 1202–1206.
53. Singh, Y.P.; Agrawal, A. Introduction to Cooperative Learning. *Indian Streams Res. J.* **2011**, *1*, 1–9. Available online: <https://www.researchgate.net/publication/270494960> (accessed on 14 February 2021).
54. Ratnasari, D.; Darsiharjo; Yani, A. Comparative Study of Geography Education Curriculum in Indonesia and Malaysia. *IOP Conf. Ser. Earth Environ. Sci.* **2019**, *286*. [[CrossRef](#)]
55. Andrini, V.S. The effectiveness of inquiry learning method to enhance students' learning outcome: A theoretical and empirical review. *J. Educ. Pract.* **2016**, *7*, 38–42.
56. Munguti, S. Variety of learning resources used in the teaching and learning of geography in public schools in makueni county and their effect on performance in the Kenya Certificate of secondary education in the subject in the county. *Eur. J. Educ. Stud.* **2017**, *3*, 704–731. [[CrossRef](#)]
57. Hungerford, H.R.; Volk, T.L. Changing learner behavior through environmental education. *J. Environ. Educ.* **1990**, *21*, 8–21. [[CrossRef](#)]
58. Akintunde, E.A. Theories and concepts for human behavior in environmental preservation. *J. Environ. Sci. Public Health* **2017**, *1*, 120–133. [[CrossRef](#)]