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# Effectiveness Of Problem Based Learning Model On The Improvement Of Geographic Literacy

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**Abstract.** This study was conducted to analyze the differences in improving students' geographic literacy using problem-based learning models compared to conventional learning models, as well as the significant influence of problem-based learning models on improving students' geographic literacy skills. The research method used in this study is an experimental model with a quasi-experimental model. Where in the quasi-experimental model consists of two classes, namely the experimental class and the control class. The population and sample used in the study were 60 grade 6 students, with 30 students in each class. Based on the results of the N-Gain calculation, it is known that students in the experimental class have an N-Gain value of 57.6438 ≈ 57.6%, with a fairly effective category. While the results of the N-Gain acquisition for students in the control class were 35.3327 ≈ 35.3%, with an ineffective category. Based on these data, it can be concluded that the use of problem-based learning models has a significant difference compared to learning using conventional methods on students' geographic literacy skills in the world tour material..

**Keywords:** Problem Based Learning Model, Geographic Literacy

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## INTRODUCTION

The Indonesian education system, as outlined in the SISDIKNAS Law, aims to cultivate well-rounded individuals. This goes beyond just academic knowledge, emphasizing the development of strong moral character, a sense of national pride, and the capacity to contribute positively to society. While the government is actively working towards these goals, they have yet to be fully realized.

Online newspaper Media Indonesia highlights the results of the 2022 PISA. The results of the study conducted by the For International Student Assessment (PISA), which were announced on December 5, 2023, Indonesia was ranked 86th with a score of 379 points in mathematics, 398 points in science, and 371 points in literacy. This year's PISA results are lower than the previous results or have experienced a significant decline (learning loss) of around 12-13 points. Javier, Faisal (2023, December 12).

Based on the PISA results, the literacy rate of Indonesian students aged 15 years is still below the average of other participating countries, including Singapore and Malaysia. This finding identifies a significant gap in the literacy achievement of Indonesian students. UNESCO has emphasized that literacy is a fundamental right of every person and the foundation for lifelong learning (Utami, WS, & Zain, IM., 2018). Many factors cause a decline in PISA score results, including a lack of innovation in learning. According to Reigelth (Syamsuar, S., & Reflianto, R., 2019), innovation in learning creates new methods that are tailored to the needs and

characteristics of each student. This involves planning interesting learning materials, selecting varied activities, and considering learning objectives and challenges that students may face.

The application of innovative learning methods by teachers contributes significantly to the achievement of students' life goals, thus producing quality graduates who are ready to face future challenges. Innovation in learning has been proven to increase the effectiveness and efficiency of the teaching and learning process. Teachers as learning facilitators have a very important role in encouraging students to achieve their maximum potential and realize their life goals (Sadulloh, Uyoh, et al. 2022). In line with this opinion, John Dewey (Sopandi, W.,2021) stated that teachers who are unable to innovate in teaching are the same as robbing students of their future.

The purpose of social studies learning is to prepare students to know their rights and obligations as members of society and good citizens and to provide a basis for social knowledge and have a high social spirit to continue their education at a higher level (Purnamasari & Mushafanah., 2019; Rezania, V., & Afandi, R., 2020). In line with this opinion, the problem-based learning model according to Alika (2024) is a model that can connect social studies learning with actual problems faced by society. Thus, students not only gain theoretical knowledge, but can also develop the skills needed to face future challenges.

Another opinion states that problem-based learning is a learning model characterized by the presence of real problems as a learning context (Orozco, J. A,. & Yangco, RT., 2016). Through this approach, students are trained to develop high-level cognitive skills such as critical thinking, analysis, and synthesis in order to find solutions to the problems faced.

Blake and Catrin (2016) stated that geographic literacy equips individuals, especially students, with the ability to make rational decisions regarding the choice of residence and adaptation to the environment. Furthermore, geographic literacy is also important in efforts to mitigate and adapt to natural disasters (Khotimah, SK, Prasetyo, K., Prasetya, SP, & Nasution, N. 2022). Practical and simple geographic literacy skills can help students in using and reading maps through the components of direction, distance, route, scale, and symbols on the map (Maryani. 2022).

The importance of having geographic literacy skills, especially in science learning, because science learning focuses on social sciences, training individuals to be able to make decisions based on conceptual information and be able to solve problems. This is in line with the statement from the National Geographic Society (2008) that geographic literacy is a skill that is needed for several reasons such as increasing economic competitiveness, maintaining quality of life, preserving the environment, and ensuring national security. Meanwhile, according to Kierski (2019), there are six ways to improve geographic literacy, namely:

providing geographic knowledge in education, emphasizing maps as geographic tools, emphasizing the use of digital maps rather than paper maps, emphasizing that maps are not just for geographers, focusing on GIS usage skills, and helping students use geographic tools.

Reperger (Sugiono, 2020) improving geographic literacy skills can be done by exploiting geographic literacy in schools and can provide meaningful learning for everyday life. Providing meaningful learning can be done by implementing learning using learning models. One of the learning models that can exploit geographic literacy skills is the problem-based learning model.

Problem-based learning model is a learning model characterized by the existence of real problems as a context for students to learn critical thinking and problem-solving skills and can gain knowledge. This is in line with the opinion of Orozco & Yangco (Khotimah, et al., 2022) problem-based learning is a learning model that is a learning process to solve real problems. Problem-based learning can also improve students' abilities in analyzing, evaluating, creating and solving problems (Sugiyono, 2020).

Based on the results of field observations of students at an elementary school, it shows that there are deficiencies in the ability to read, interpret, and apply basic geographical concepts such as coordinates or directions, maps, climate, and the environment. One of the problems found by many students is the difficulty in identifying the location of the island of Sulawesi on the map. This shows that students' understanding of maps and the geographical location of Indonesia is still low.

The second problem is that students have difficulty in connecting the concept of geographical location with the physical and social characteristics of a region. They have not been able to connect the position of a place with the natural conditions and life of the community there. For example, students have not been able to understand the positive and negative impacts of Indonesia's geographical location.

This study aims to analyze the effectiveness of the application of problem-based learning models on improving students' geographic literacy skills compared to conventional learning models. Specifically, this study wants to find out whether there is a significant difference between the two learning models in improving students' understanding of geographic concepts.

## METHODOLOGY

This study uses a quasi-experimental approach to test the effectiveness of the problem-based learning model. The research sample consisted of 60 sixth-grade students at an elementary

school in the Cirebon district. The sample was divided into two groups with the same number, namely the experimental class (VI-A) with 30 students and the control class (VI-B) with 30 students. The experimental class will be treated with a problem-based learning model, while the control class will use a conventional learning model.

This study used an essay test as a data collection instrument. This test was given before (pretest) and after (posttest) treatment to measure the improvement of students' geographic literacy skills. The data obtained were then tested for normality and homogeneity before being analyzed using statistics to prove the truth of the research hypothesis

**Table 1.** Alternative Treatment Post-Test-Only Research Design with NonEquivalent Groups

| Group | Pre test | Treatment | Post test |
|---|---|---|---|
| Group Experiment | O1 | X | O2 |
| Control Group | O3 | Y | O4 |

Information:
O1 : Measuring geographic literacy skills in the experimental group (Pretest)
O2 : Measuring geographic literacy skills in the experimental group (posttest)
X : Providing treatment with a problem-based learning model
Y : Providing treatment with a con learning modelconventional
O3 : Measuregeographic literacy skills in the control group (pretest)
O4 : Measuring geographic literacy skills in the control group (posttest)

## RESULTS AND DISCUSSION

a) Geographic Literacy Ability Pretest Data Description

This Pretest is a research instrument given to students in the experimental class and control class before being given treatment. The pretest was conducted to determine the initial abilities of students in the science subject with the material around the world. The geographical literacy test questions consist of 5 questions in the form of descriptions. The description of the pretest data on the geographical literacy abilities of students in question is as follows.

The descriptive statistics of the experimental class pretest showed a central tendency in the form of an average of 52.67 and a median of 52.50. In addition, a standard deviation value of 10.23 was obtained, indicating a fairly high level of data distribution. The lowest score for students in the ex le the average score for the con viation is 7.35, the lowest score The frequency histogram of pret n the following figure. From the d e experimental class and the cor

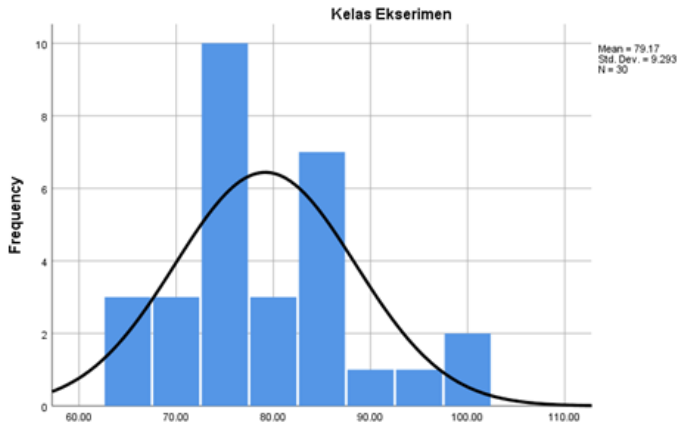


**Figure 1.** Pretest of Geographic Literacy Skills of Experimental Class Students

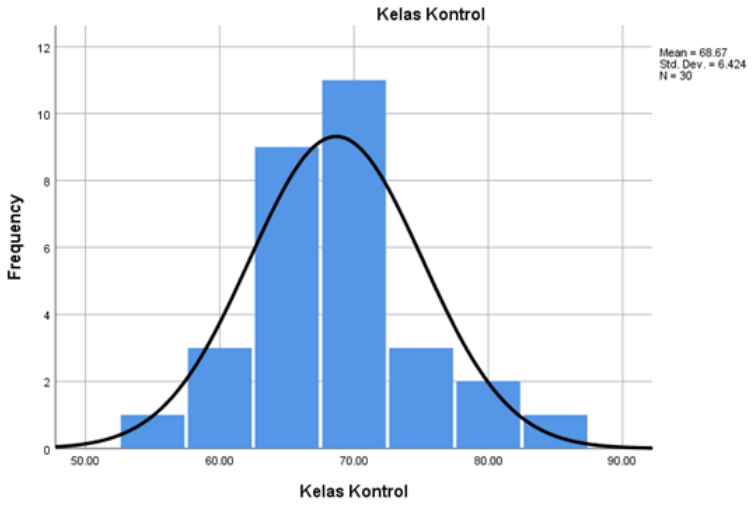


**Figure 2.** Geographic Literacy Ability Test of Control Class Students

The two images above show that there is diversity in geographic literacy skills in both the experimental and control classes. Before being given treatment in both classes, the geographic literacy skills of students were almost the same in both the experimental and control classes. Geographic literacy skills in the experimental class were more diverse than in the control class when the pretest questions were given.

### a) Posttest Data Description of Geographic Literacy Ability

After the treatment was carried out in the experimental class and the control class, a posttest was given with the aim of determining the students' geographical literacy abilities

The analysis of the posttest data of the experimental class showed an average score of 79.17, a median of 75.00, and a standard deviation of 9.29. This indicates that there is quite a high variability in students' final abilities, although overall there is a significant increase compared to the pretest. The lowest value obtained is 65.00 and the highest value is 100.00. While the average value of the control class posttest is 68.67, the median is 70.00, and the standard deviation is 6.42. The lowest value of the control class is 55.00 and the highest value is 85.00.

**Figure 3** Posttest of Geographic Literacy Skills of Experimental Class Students

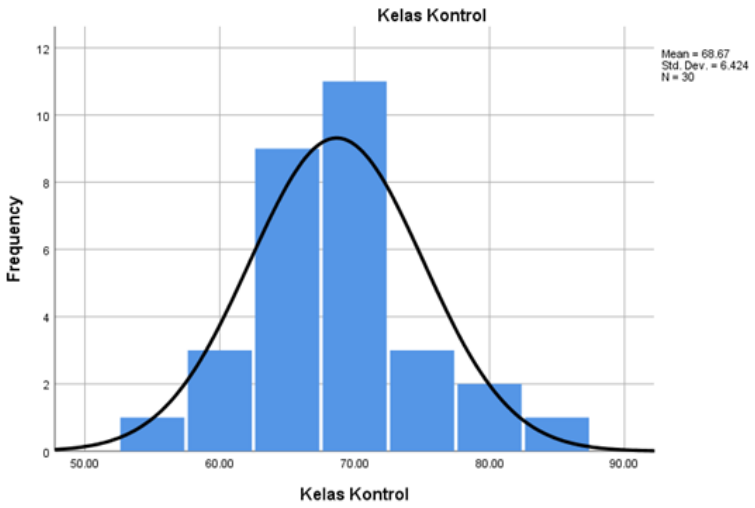


**Figure 4** Posttest of Geographic Literacy Skills of Control Class Students

In both histogram images above, it shows a significant difference in geographic literacy skills in both classes. The average low score was obtained in the control class.

**b) Paired Sample T-test of pretest and posttest scores of the Experimental Class' Geographical Literacy Ability**

**Table 4.**Paired Sample T-test Results for Pretest and Posttest Values of Experimental Class Paired Samples Test

| | Paired Differences | | | | | | |
|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | t | df | Sig. (2-tailed) |

| | | | | | Lower | Upper | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pair 1 | Pre Test - Post Test | -26.50000 | 6.03867 | 1.10250 | -28.75488 | -24.24512 | -24.036 | 29 | .000 |

Based on the table of Paired Sample T test results in the experimental class, the significance value is α <0.05, indicating a significant difference between the initial variable (Pretest) and the final variable (posttest). This indicates that there is a significant influence on the difference in treatment of each variable. This is reinforced by an increase in the average value to 26.50. From the data presentation, it can be concluded that the treatment of problem-based learning models has an effect on students' geographic literacy skills.

**c) N-gain Test of Students' Geographical Literacy Ability**

The results of the N-gain test of pretest and posttest achievement scores on the geographic literacy skills of the experimental and control classes can be seen in the table below.
control classes can be seen in the table below.

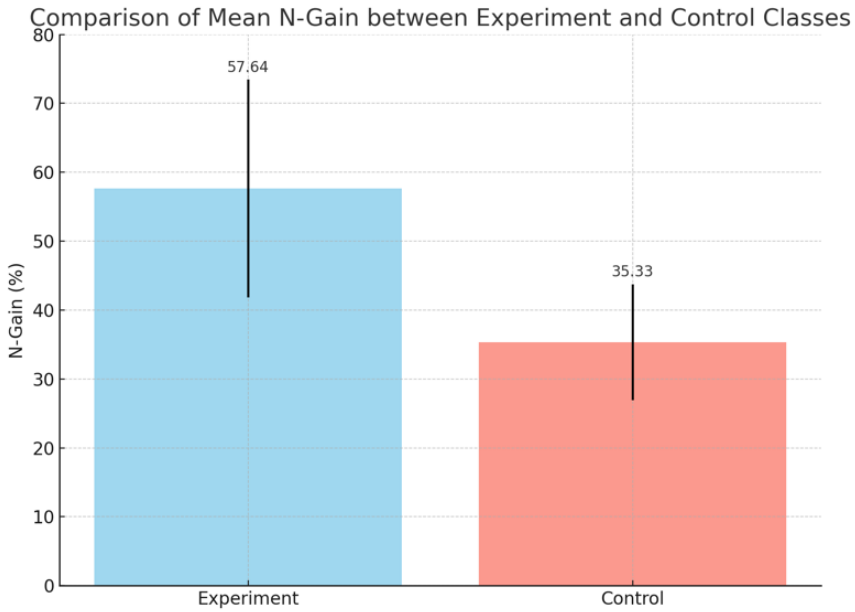


**Figure 5.** N-Gain Data

**Table 6** N-Gain Effectiveness Interpretation Category

| Percentage (%) | Interpretation |
|---|---|
| < 40 | Ineffective |
| 40 - 55 | Less Effective |
| 56 - 75 | Quite Effective |
| > 76 | Effective |

Based on the results of the N-gain score test calculation, it shows that the average N-gain score of the experimental class (problem-based learning model) is 57.6438 ≈ 57.6%, which is included in the fairly effective category. With a minimum N-gain value of 36.36% and a maximum value of 100.00%. While the average N-gain value of the control class (conventional learning model) is 35.3327 ≈ 35.3%, which

is included in the ineffective category. With a minimum N-gain value of 20.00% and a maximum of 50.00%. So it can be concluded that the use of problem-based learning models is quite effective in improving student learning outcomes in science and natural science subjects on the topic of traveling around the world for grade 6 students of SD Negeri Pengalaman. While the use of conventional learning models is not effective in improving student learning outcomes in science and natural science subjects on the topic of traveling around the world for grade 6 students at one of the elementary schools in Cirebon Regency

The problem-based learning model goes through five main stages in its learning. The five stages of problem-based learning include student orientation to the problem, organizing students to learn, guiding investigations both individually and in groups, developing and presenting results, then analyzing and evaluating the problem-solving process. Before implementing the problem-based learning model, the geographic literacy skills of students in the experimental group and the control class were measured first through an initial test (pretest). After being given treatment or traitment, students in both the experimental and control classes were given a final test (posttest). The purpose of giving this posttest question is to measure the geographic literacy skills of students in the material around the world.

Descriptive statistical analysis showed that there was no significant difference between the average geographic literacy scores of students in the experimental class (52.67) and the control class (51.67) at the pretest. However, after being given treatment, the average posttest score of the experimental class increased significantly to 79.17, much higher than the control class which only reached 68.67. This difference shows that the problem-based learning model is very effective in improving students' geographic literacy skills.

The pretest results showed that students in both groups had not mastered the world tour material optimally. This can be seen from several answers that were less than perfect. After being given learning treatment, both groups experienced an increase in their average scores on the posttest. However, a significant increase occurred in the experimental group using the problem-based learning model, compared to the control group.

The t-test aims to determine the difference between literacy skills using problem-based learning models with control classes using conventional learning models. In the experimental class, the t-count value < t-table is 0.471< 2.048 and the significance value α < 0.05, namely sig (2-tailed) of 0.641> 0.05 Ho is accepted and H1 is rejected. So it can be concluded that there is no significant difference between the experimental class and the control class before receiving treatment on students' geographic literacy skills.

Statistical analysis shows that the calculated t value (5.685) is much greater than the t table value (2.048) at a significance level of 5%. This means that we are very sure that the difference

in geographic literacy skills between students who learn with problem-based learning models and students who learn with Pancasila learning models is real and not due to coincidence.

These results are in accordance with previous research conducted by Sugiyarto (2020) and Suciawati Khusnul, et al (2022) showed that the problem-based learning model can be used as a learning model that can improve students' geographic literacy skills. The study showed that students can improve 21st century skills and are able to use geographic understanding and geographic reasoning in making decisions. This is in line with the opinion of Prayoga, et al (2024) that the problem-based learning model is seen as being able to overcome these problems because students' literacy skills will be trained. In the problem-based learning model, students are trained to think critically, analyze information, and make decisions. Through this process, students not only gain knowledge but also develop high-level thinking skills.

The problem-based learning model begins by providing stimulus by presenting articles related to current problems related to the material on the division of regions in six continents with their respective characteristics. The second step is to orientate on grouping the details of existing problems and to find out how to solve them. The third step is to guide students to conduct investigations as individuals or groups. In this stage, students discuss with their group mates in analyzing the solution to the problem. The fourth step is for students to develop and present with their group mates to describe the results of the problem-solving discussion. The last step is to conduct problem-solving analysis and evaluation in providing conclusions on problem solving with the teacher.

Problem-based learning teachers only act as facilitators in guiding students in carrying out problem-solving discussions. In other words, the problem-based learning model is a learning model that is centered on students. From a constructivist perspective, problem-based learning can encourage students to build their own knowledge effectively and flexibly. The problem-based learning model is not only limited to memorizing concepts or materials, but students are also trained to think critically and are able to use scientific methods in conveying real problems. Thus, the knowledge obtained by students becomes more meaningful and relevant to everyday life.

According to Dikmenli (2014), students can have good geographical literacy when they can apply their understanding and knowledge of geography to solve problems. He further said that geographical literacy is not only about memorizing, but also involves critical, creative, and problem-solving thinking skills. The benefits of having geographical literacy skills according to Nyambal & Dziauddin (2020) are that it can provide students with geographical knowledge, skills, and values so as to produce citizens who are competitive, insightful, and can manage nature and state resources responsibly. The use of problem-based learning models invites

students to work together in groups to find solutions to problems they often encounter in their daily lives. The implementation of contextual learning by presenting problems to students serves to encourage enthusiasm for learning and motivation to solve problems in the active learning process, collaborate, and the emergence of various concepts resulting from students' thinking (Kartini, et al, 2022).

The application of problem-based learning models can improve students' understanding, especially geographic literacy skills. Students' learning outcomes have increased significantly in the material on the division of six continents and their characteristics. Students can analyze and find solutions to problems that occur in the surrounding environment because in the problem-based learning process students seek information, investigate, and solve environmental problems well (Amin, S., et al.2020). Thus, it can be concluded that the problem-based learning model develops students' abilities in analyzing geographical situations and finding appropriate solutions

## CONCLUSION

Based on the results of the hypothesis test, it shows that students who learn using the problem-based learning (PBL) method have a better understanding of geographic literacy compared to students who learn using conventional learning models. The problem-based learning model is very effective because students are invited to work together in groups, think critically, and find solutions to real problems related to the division of the six continents and their characteristics. Conventional learning models are less effective in improving geographic literacy skills because students find it difficult to solve real problems related to the material. In addition, learning with conventional models makes students quickly bored and unenthusiastic about learning..

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## REFERENCES

Amin, S., Utaya, S., Bachri, S., Sumarmi, S., & Susilo, S. (2020). Effect of problem based learning on critical thinking skills and environmental attitude. Journal for the Education of Gifted Young Scientists, 8(2), 743-755.

Alam, Syamsir. (2023, December 18). PISA 2022 Results Reflection of National Education Quality 2023. Media Indonesia accessed

athttps://www.kompas.id/baca/humaniora/2023/12/06/narasi-skor-pisa-indonesia-jangan-seolah-olah-prestasi

Alika, O. (2024). The Influence of Geographical Concepts through Science Learning for Grade 4 Elementary School. Pena Edukasia, 2(3), 80-83.

Blake, Catrin. 2016. Defining Geo Literacy: How Students Benefit From Geographic Reasoning. Concordia University Nebraska.

Dikmenli, Y. (2014). Geographic Literacy Perception Scale (GLPS) Validity and Reliability Study. Online submissions, 4(1), 1-15.

Javier, Faisal. (2023, December 12). Indonesia's Score in PISA 2022 Experiences a Decline. Tempo. Accessed onhttps://data.tempo.co/data/1803/skor-indonesia-di-pisa-2022-alami-penurunan

Kartini, D., Nurohmah, AN, Wulandari, D., & Prihantini, P. (2022). Relevance of Problem Based Learning (PBL) Learning Strategy with 21st Century Learning Skills. Tambusai Education Journal, 6(2), 9092-9099.

Kierski, Joseph. 2019. Six Ways to Increase Geoliteracy. Education Winter Esri.

Khotimah, SK, Prasetyo, K., Prasetya, SP, & Nasution, N. (2022). The Influence of Problem Based Learning Model on Geographic Literacy Skills in Social Studies Learning on Inter-Regional and Inter-Country Trade Activities. Journal of Education: Research and Conceptual, 6(3), 510-519. (4)

Maryani, E. (2022). Geography in the Digital Era. Jendela Publishing

National Geographic Society (NGS). 2008. Geography for Life: The National Geography Standards (Washington, DC: Author

Nyambal, J., & Dziauddin, MF (2020). GEOGRAPHIC LITERACY AMONG GEOGRAPHY STUDENTS OF SULTAN IDRIS EDUCATION UNIVERSITY (UPSI). Malaysian Journal of Tropical Geography (MJTG), 46(1 and 2), 120-146.

Orozco, J.A,. & Yangco, R.T. (2016). Problem-Based Learning: Effect on Critical Thinking Skills in Biology. Asian Journal of Biology Education, 9, 3-10

Prayoga, EB, Kurnianto, FA, Susiati, A., Astutik, S., & Mujib, MA (2024). The Influence of Problem Based Learning Model Assisted by TikTok Media on High School Students' Geographic Literacy Skills. GEOGRAPHY LEARNING MAGAZINE, 6(2), 262-269.

Purnamasari & Mushafanah. (2019). Development of Basic Concepts of Social Studies (Theory and Application in Learning in Elementary Schools). Semarang: Magnum Pustaka Utama

Rezania, V., & Afandi, R. (2020). Textbook for Elementary School Social Studies Learning Development Course. Umsida Press, 1-116

Sadulloh, Uyoh, et al. (2022). Pedagogy (Science of Education). Bandung: Alfabeta.

Sopandi, W. (2021). RADEC Learning Model (Theory and Implementation in Schools). UPI Press.

Sugiyarto, 2020. Development of a Junior High School Social Studies Learning Model Based on Geographic Literacy to Improve 21st Century Skills. Indonesian University of Education

Syamsuar, S., & Reflianto, R. (2019). Education and challenges of information technology-based learning in the era of the industrial revolution 4.0. E-Tech: Scientific Journal of Educational Technology, 6(2).

Utami, WS, & Zain, IM (2018). Geography literacy can develop Geography skills for high school students: is it true?. In IOP Conference Series: Materials Science and Engineering (Vol. 296, No. 1, p. 012032). IOP Publishing.