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Development of Learning Media using Google Maps Application and Here Wego Application to Improve Spatial Thinking Ability in Students at SHS 6 Pinggir

***Laila Safina, Yurni Suasti, Ernawati**

Master Program of Education Geography, Faculty of Social Science – Universitas Negeri Padang
*E-mail: lailatiarna28@gmail.com

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ABSTRACT

Students participate in the Teaching and Learning Process (TLP) passively, resulting in a lack of development of their creative power in learning. The learning process that occurs in the classroom becomes meaningless. Even though learning will be more meaningful if students experience what they learn, not just know it, educators try to make what students learn at school useful in everyday life. The ability to think spatially is the ability to recognize space and is a strong focus in geography education. Students' ability to think spatially can help them understand the essence of geography material. The research method used in this research is a descriptive method with a quantitative approach. This research is part of the research on the development of a spatial thinking ability test instrument. Based on the results of hypothesis testing using the t-test at a significant level of 0.05, That is, there is no significant difference in student learning outcomes between the learning process using the Google Maps application learning media and the application Here We Go on improving spatial thinking skills at SHS 6 Pinggir. The results of these calculations show that the use of Google Maps and Here We Go application learning media in geography learning has a positive impact on improving spatial thinking skills.

Keywords: Spatial Thinking, Learning Media, Google Maps, Here WeGo.

INTRODUCTION

Learning media is one component of learning support. Learning media has the benefit of increasing student interest and interactiveness. In this modern era, where everything is as sophisticated as it is today, many teenagers have a decreased interest in learning. The conventional learning process is considered less fun. Learning is only centered on the teacher or books, making students bored to the point of complaining. Innovation and the development of new learning media are needed, one of which is interactive learning using technology.

Students participate in TLP passively, resulting in a lack of development of their creative power in learning. The learning process that occurs in the classroom becomes meaningless. Even though learning will be more meaningful if students experience what they learn, not just know it, educators try to make what students learn at school useful in everyday life.

Geography education is one of the spearheads of education in Indonesia that is capable of developing character values. These character values can develop the knowledge, skills, and attitudes of students (Khoir & Yanti, 2023). In the current era of the Industrial Revolution 4.0, geography education can prepare high school students to face competition and challenges to improve abilities, namely the ability to think spatially (Nova et al., 2020).

Spatial thinking is a cognitive set, including elements of space, tools, and thought processes or considerations (National Research Council, 2006). Spatial abilities form mental abilities in forming and manipulating visualized objects and in analyzing objects or objects related to a three-dimensional perspective (Suasti et al., 2018). Spatial thinking is the main characteristic of the process of practice and theory related to geography learning activities (Bednar et al., 2022).

The ability to think spatially is the ability to recognize space and is a strong focus in geography education (Flynn, 2018). Students' ability to think spatially can help students understand the essence of geography material, namely understanding geosphere phenomena (Chandra et al., 2021). In the 2013 curriculum, learning emphasizes the processes experienced by students. The process experienced by students in learning can provide a deep understanding so that the material is not just memorized but can be interpreted in more detail.

Eriksen (2020) explained that in the current era of globalization, technology has become an inseparable part of all aspects of human life. In almost all activities, humans make use of technology, both simple technology and sophisticated technology. The creation of technology, by its essence, is carried out to facilitate human life activities. Furthermore, according to Eriksen (2020), technology, especially information technology, has a very large influence on the way humans carry out the learning process and obtain information and knowledge.

Information technology can act as a learning medium that is designed and developed to convey the information and knowledge needed by the audience. Technological developments in digital form have made hardware and software, or computer software, physically smaller and more portable. Even though it is portable, the device is capable of storing large amounts of information.

One of the widespread uses of technology today is the use of smartphones, or in English, a smartphone with an Android-based operating system. A smartphone is a modern development of a mobile phone by adding a variety of modern internet-based applications to make it easier in the field of communication. Meanwhile, Android is an operating system for gadgets such as cell phones and tablet computers that was founded by the Android Inc. company based on a simple Linux program so that it is easy to redevelop.

Educational technology and learning technology have led to efforts to realize various ideas and thoughts as well as action procedures that must be carried out to realize the innovation process in the world of education so that it can produce something new whether it is related to ideas, processes, procedures, and results that are directly related directly or indirectly with a variety of learning resources which include the environment, people, tools, procedures, concepts, theories, technology, media, and problem-solving procedures themselves, even in the current era including electronic and virtual learning models both personal and institutions to the accreditation system for innovation findings in the world of education and learning.

Of the many educational institutions that want to develop learning using technology-based learning media to improve student learning outcomes, one of them is SHS 6 Pinggir, located on Jl. Tambusai Meranti River, Pinggir District, Bengkalis Regency, Riau.

Especially in the geography subject, in some basic competencies, some students have not achieved minimum mastery. Teaching staff who rarely use learning media is one of the factors causing students' lack of motivation to learn geography. The method often used in this school is the mind mapping method, which is a creative note-taking method to remember information by forming a pattern of interrelated ideas. In addition, the media used to convey learning material more often only uses blackboards. The following is the data (Table 1) for the daily test results of SHS 6 Pinggir students in one semester.

Table 1. Grade X students' daily test scores

Class	The number of students	KKM	Students' daily test scores under KKM			
			KD 3.1	KD 3.2	KD 3.3	KD 3.4
X IPS 1	22 students	75	57.1%	21.2%	10.7%	53.5%
X IPS 2	22 students	75	50%	46.4%	42.8%	39.2%
Class	The number of students	KKM	Students' daily test scores under KKM			
			KD 3.1	KD 3.2	KD 3.3	KD 3.4
X IPS 1	22 students	75	57.1%	21.2%	10.7%	53.5%
X IPS 2	22 students	75	50%	46.4%	42.8%	39.2%

Source: Data (2022) SHS 6 Pinggir School

Therefore the researcher intends to develop the Google Maps application and the Here Wego application as one of the geography learning media in class X IIS because all students already use Android smartphones.

METHODS

The research method used in this research is a descriptive method with a quantitative approach. Study this is part of the research on the development of a spatial thinking ability test instrument. The method used to develop students' spatial thinking skills is by using the Google Maps and Here Wego applications. This research was conducted in class X IIS 1 and X IIS 2. The selection of these two classes was based on average learning outcomes which were almost the same compared to other classes studying geography in the odd semester of 2021/2022. The trial of this research instrument was carried out after students obtained material 3.2, namely basic knowledge of mapping (Erianjoni et al., 2023). The pilot test takes 45 minutes with 20 questions. This spatial thinking ability test instrument was developed based on spatial thinking indicators according to Huynh & Sharpe (2013).

The spatial thinking indicators developed into test instruments consist of six indicators, namely analysis, spatial interaction, scale, representation, application, and comprehensiveness. Calculation of validity using the Biserial Point Correlation formula. Before conducting the research, the validity of the instrument was first tested to find out how many valid instruments. The question is said to be valid if the r count is greater than r_{table}, while the question is said to be invalid if the r count is less than r_{table} at the significance level $\alpha = 0.05$ for $n = 30$ is 0.361. The results of testing the validity of the research instrument can be seen in the following Table 2 below.

Table 2. Instrument validity test results

No	Validity test		
	r_{table}	r_{table}	Criteria
1	55,23	0.361	Valid
2	0.01	0.361	Invalid
3	63.01	0.361	Valid
4	63.01	0.361	Valid
5	63.01	0.361	Valid
6	-1.43	0.361	Invalid
7	2.45	0.361	Valid
8	2.45	0.361	Valid
9	1.28	0.361	Valid
10	-0.12	0.361	Invalid
11	-0.42	0.361	Invalid
12	1.39	0.361	Valid

No	Validity test		
	r_{table}	r_{table}	Criteria
13	1.92	0.361	Valid
14	2.66	0.361	Valid
15	1.99	0.361	Valid
16	3,31	0.361	Valid
17	1.17	0.361	Valid
18	1.76	0.361	Valid
19	3,14	0.361	Valid
20	-1.13	0.361	Invalid

Source: Instrument validity test results, 2023.

Based on Table 2 of instrument validity test results, it can be concluded that from the 20 items, 15 items were obtained that were valid, and 5 invalid items. So, the questions that were used as instruments were tested on a sample of 15 multiple-choice questions. The reliability test in this study used the KR-20 formula with a significant level of 5%. With the following reliability classification.

Table 3. Reliability classification

Range	Interpretation
0 – 0.20	Very low
0.20 – 0.40	Low
0.40 – 0.70	Currently
0.70 – 0.90	Tall
0.90 – 1.00	Very high

Source: Jihad & Haris, 2003.

Table 4. Reliability Test Results

N	A	r_{count}	r_{table}	Conclusion
30	0.05	**4,26**	0.59	Moderate reliability

Source: Instrument reliability test results, 2023.

Based on the results of calculating the reliability of the instrument, it was obtained r_{count} = 4.26, it can be concluded that the instrument has a moderate level of reliability, and is suitable for use in research.

Table 5. Results of calculation of difficulty level of research instruments

No	Difficulty Level	
	Difficulty Index	Criteria
1	0.67	Currently
2	0.20	Hard
3	0.67	Currently
4	0.67	Currently
5	0.67	Currently
6	0.27	Hard
7	0.67	Currently
8	0.67	Currently
9	0.70	Currently
10	0.77	Easy
11	0.70	Currently
12	0.67	Currently
13	0.63	Currently
14	0.70	Currently
15	0.77	Easy
16	0.67	Currently

No	Difficulty Level	
	Difficulty Index	Criteria
17	0.73	Easy
18	0.60	Currently
19	0.53	Currently
20	0.67	Currently

From the table above it is known that there are 15 items tested that have a difficulty level in the "moderate" category because the P value is in the range between 0.31 - 0.70, while 3 items have a difficulty level in the "easy" category because the P value is in the range between 0.71 - 1.00 and there are 2 items that have a difficulty level in the "difficult" category because the P value is in the range of 0.00 - 0.30. Analyzing the data from the test results of the instrument test for spatial thinking abilities of class X Social Science 1 and X Social Science 2, the researcher used the prerequisite analysis test first, namely the normality test. The normality test used is the Lilliefors test, using the Lilliefors test it can be said that the population is normal if L count ≤ L_{table}. After doing the calculations, the researcher got the result that the class X Social Science 1 value, namely L_{count} = -0.167 with n = 15 and a significant level of α = 0.05, got a table price of 0.220. Because L count ≤ L_{table}, namely 0.167 ≤ 0.220, H_0 is accepted.

Then in class X Social Science 2, the researcher got the result that the value of L_{count} = -0.184 with n = 15 and a significant level of α = 0.05, and in the Lilliefors table the price table was 0.220. Because $L_{count} \leq L_{table}$, namely - 0.184 ≤ 0.220, then H_0 is accepted. From this statement, the samples of the two experimental classes used came from populations with normal distribution.

Table 6. Normality test calculation results

Google Maps		Here Wego	
Pre Test	Post Test	Pre Test	Post Test
56,8	70,8	55	70,33

RESULTS

This research was conducted in 3 meetings each in class X Social Science 1 and Media and Here WeGo, then at the end of the meeting a test was given after being given treatment (post-test). Google Maps application learning media and students who use the Here WeGo application learning media can be seen in Table 7 below.

Table 7. The average value of using learning media

Group	N	L_{count}	L_{table}	Information
Class X Social Science 1 (Google Maps)	15	-0.167	0.220	Normal Distributed Data
Class X Social Science 2 (Here WeGo)	15	-0.184	0.220	Normal Distributed Data

From the table above it can be seen that the average pre-test score of students who study with the Google Maps application learning media is 56.8, and students who learn using the Here WeGo application learning media are 55. The two values show that there is no significant difference. This means that students' initial ability to understand the subject matter is almost the same. The analysis requirements test used by the researcher is the normality test using the Liliefors test and the homogeneity test using the fisher test. After testing for normality in class X Social Science 1 with the learning media of the Google

Maps application (post-test) the value of L_{count} = -0.167 <0.220 = L_{table} and in class X Social Science 2 with the learning media of the Here WeGo application (post-test) is obtained value of L_{count} = -0.184 <0.220 = L_{table} so it can be concluded that both are normally distributed and feasible to do the homogeneity test.

After testing for normality, a homogeneity test is carried out using the Fisher test to find out whether the data has the same variance or not. In the homogeneity test calculation, the calculated F_{value} for class X Social Science 1 was 1.08 with an F_{table} of 2.48. While Class X Social Science 2 has an F_{count} of 1.04 with an F_{table} of 2.48. Because $F_{count} < F_{table}$, it can be concluded that the two classes have the same or homogeneous variance. Based on the results of hypothesis testing using the t-test at a significant level $\alpha = 0.05$. That is, there is no significant difference in student learning outcomes between the learning process using the Google Maps application learning media and the application WeGoon improving spatial thinking skills at SHS 6 Pinggir. The results of these calculations show that the use of Google Maps and Here WeGo application learning media in geography learning has a positive impact on improving spatial thinking skills.

CONCLUSIONS

Based on the provisions, if the value of t count < from t table, it means that students' spatial thinking skills can increase by teaching and learning using the Google Maps application learning media with the applicationHere WeGoin class X geography learning at SHS 6 Pinggir.

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