

The Influence of the Student Facilitator and Explaining (SFAE) Learning Model on Critical Thinking Abilities and Geography Learning Outcomes of High School Students

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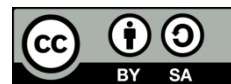
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ABSTRACT

Students' low critical thinking skills will of course also affect their learning outcomes. This is influenced by the use of conventional learning models. This research aims to examine the influence of the Student Facilitator and Explaining (SFAE) model on students' critical thinking abilities and geography learning outcomes for high school students. This research was conducted experiments using a posttest only control group design. The research samples in the form of control and experimental classes were selected using the cluster random sampling method which had previously been tested for homogeneity via SPSS V.25 and was proven to be homogeneous. The data collection techniques used were critical thinking ability tests in the form of descriptions, geography learning outcomes tests in the form of multiple choice, observation, interviews and documentation. The data analysis techniques used are normality test, homogeneity test, hypothesis test, critical thinking ability data analysis and learning outcomes data analysis. Based on the research results, it shows that the Student Facilitator and Explaining (SFAE) learning model has a significant effect on students' critical thinking abilities based on the Independent Sample t-test with a significance value of $0.001 < 0.05$ and also has a significant influence Influence on students' geography learning outcomes based on independent sample T-test with a significance value of $0.016 < 0.05$. This makes the Student Facilitator and Explaining (SFAE) learning model an alternative model that can be applied in schools to improve students' critical thinking skills and geography learning outcomes, especially high school students.

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ABSTRACT

Rendahnya kemampuan berpikir kritis siswa tentu akan berpengaruh pula terhadap hasil belajarnya. Hal ini dipengaruhi oleh penggunaan model pembelajaran yang bersifat konvensional. Penelitian ini memiliki tujuan guna mengkaji pengaruh dari model *Student Facilitator and Explaining* (SFAE) terhadap kemampuan berpikir kritis siswa dan hasil belajar geografi siswa SMA. Penelitian yang dilaksanakan ini termasuk jenis eksperimen dengan menggunakan *posttest only control group design*. Sampel penelitian berupa kelas kontrol dan eksperimen dipilih melalui metode *cluster random sampling* yang sebelumnya telah dilakukan uji homogenitas melalui SPSS V.25 dan terbukti nilainya homogen. Teknik pengumpulan data yang digunakan yaitu tes

kemampuan berpikir kritis berupa uraian, tes hasil belajar geografi berupa pilihan ganda, observasi, wawancara dan dokumentasi. Teknik analisis data yang digunakan yaitu melalui uji normalitas, homogenitas, uji hipotesis, analisis data kemampuan berpikir kritis dan analisis data hasil belajar. Berdasarkan hasil penelitian menunjukkan bahwa model pembelajaran *Student Facilitator and Explaining* (SFAE) berpengaruh signifikan terhadap kemampuan berpikir kritis siswa berdasarkan uji *independent sample t-test* dengan nilai *signifikansi* $0,001 < 0,05$ dan berpengaruh signifikan pula terhadap hasil belajar geografi siswa didasarkan pada uji *independent sample t-test* dengan nilai *Sig* $0,016 < 0,05$. Hal tersebut menjadikan model pembelajaran *Student Facilitator and Explaining* (SFAE) sebagai salah satu alternatif model yang bisa diimplementasikan di sekolah agar meningkatkan kemampuan berpikir kritis dan hasil belajar geografi siswa khususnya siswa SMA.

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Introduction

Learning carried out inside and outside the classroom is basically not just memorizing and understanding the content of the lesson, but also having to understand the process of solving problems, so that students must have the ability to solve this problem to solve the problems they face (Suryaningtyas & Setyaningrum, 2020). The ability to solve problems in the 21st century is better known as the 4C skills, namely the ability to think critically, creatively, communicate and collaborate. According to Susilawati et al. (2020) critical thinking is able to influence student learning outcomes through the ability to solve problems. Through this critical thinking ability, students can examine and process information accurately as an effort to plan and solve a problem (Astutik & Mahardika, 2020).

The existence of student learning outcomes plays a role in learning activities, because it is part of an indicator of the quality of education. Academically, learning outcomes are achievements that can be achieved after passing a series of assignments, exams, and students' activeness when asking questions during ongoing teaching and learning activities. In line with the opinion expressed by Adi et al. (2019) that quality education and increased learning outcomes are supported by available infrastructure and effective learning. The learning outcomes obtained by students can be seen from the extent to which students understand and comprehend the teacher's explanations (Ulfa, 2023).

Based on the results of the 2018 PISA research, it shows that Indonesian students' literacy skills scored 371 points with an overall average score of OECD (Organization for Economic Co-operation and Development) countries by 489, the mathematics group got a score of 379 with an overall OECD average score of 489, and for the science group, Indonesia got a

score of 396 out of the overall average score from OECD countries of 489. Through these results, it can be seen that the achievements of Indonesian students in the academic field are still underdeveloped, as are their critical thinking abilities. This low achievement is because students still lack experience in working on PISA questions in the HOTS group (Saraswati & Agustika, 2020).

Then, based on the results of interviews with SMAN Balung geography teachers, it was revealed that SMAN Balung students had low critical thinking abilities as seen from indicators of simple explanations, the ability to make conclusions as well as strategies and tactics. This low level of critical thinking is due to the continuity of the learning process which is still dominated by rote memorization, which affects learning outcomes. Another cause is that when students ask questions they do not get satisfactory answers and the feedback given by the teacher is still lacking.

Low learning outcomes indicate that students' critical thinking abilities will also be low. This statement is strengthened by research by Hamdani et al. (2019) at one of Central Lombok's high schools which stated that teaching and learning activities that only focused on the cognitive domain in the form of memorization would have an effect on the level of LOTS students' thinking abilities. Based on the results of subsequent interviews with the Geography teacher at SMAN Balung, information was also obtained that for the 2022/2023 PAT geography subject, students were only able to answer questions correctly at cognitive domain level C1-C3 and this means that it indicates that students only have the ability to remember and memorize questions without knowing the concept.

Responding to the problems above, learning models are considered to play a role in the learning process because they influence learning outcomes. Selection and application of appropriate and appropriate learning models will produce maximum output in learning outcomes. Appropriate learning strategies can maximize the cultivation of 21st century abilities (Astutik et al., 2019). It is hoped that the use of a learning model can provide a stimulus to students in improving their critical thinking skills, thereby achieving better learning outcomes, namely the SFAE learning model (Gompi et al., 2022).

Research conducted by Ruhlessin et al. (2019) stated that there is an influence of the SFAE model on student learning outcomes compared to the conventional model. Furthermore, research by Syah et al. (2021) shows that the SFAE model has a significant effect on student learning outcomes compared to the conventional model because the SFAE model has advantages such as increasing student insight, training students to express their opinions objectively and increasing student motivation. Learning geography through the implementation of the SFAE learning model is expected to direct students to improve their abilities in facing the demands of the 21st century, one of which is critical thinking.

There is a difference between this research compared to previous research, namely that the research location was carried out in Jember Regency, the population used here was high school class XI IPS and this research focuses on the ability to think critically and the results of learning geography. Apart from that, other research focuses more on science subjects and focuses more on learning outcomes only. Therefore, the aim of conducting this research is to examine the influence of the Student Facilitator and Explaining (SFAE) learning model on critical thinking skills and geography learning outcomes of high school students.

Method

This type of research is a type of quantitative research using quasi-experimental methods. This research uses a post-test only control group design. The research was carried out at SMA Negeri Balung during the Odd Semester of the 2023/2024 Academic Year. The population of this study was class XI students, totaling 3 classes including classes XI.9, XI.10 and XI.11 with a total of 108 students. The sample was determined using SPSS V.25 through a homogeneity test on the previous chapter's test scores. The results showed that they were homogeneous, so the sample was selected using the cluster random sampling method or lottery system, which then resulted in XI.9 being used as the control class while XI.11 was used as the experimental class. Next, the data collection techniques used in this research are interviews, observation, documentation and tests. Data collection used was through tests of critical thinking skills and geography learning outcomes, interviews, documentation and observation. The data analysis techniques used are normality tests, homogeneity tests and hypothesis tests. As for the critical thinking ability analysis technique, it can be seen from the formula:

$$\text{The value critical thinking skills} = \frac{\text{Total score obtained}}{\text{Total Score}} \times 100$$

Next, the value categories are grouped which are presented in Table 1.

Table 1. Categories of Students' Critical Thinking Ability Scores

No	Value Range	Cetgory
1	$90 \leq A \leq 100$	Very good (A)
2	$75 \leq B < 90$	Good (B)
3	$55 \leq C < 75$	Enough (C)
4	$40 \leq D < 55$	Not enough (D)
5	$0 \leq E < 40$	Very less (E)

Source: (Yunita *et al.*, 2018)

Meanwhile, to find out the value of student learning outcomes as follows:

$$\text{The value of learning outcomes} = \frac{\text{Total score obtained}}{\text{Total Score}} \times 100$$

The grouping of learning outcome value categories is seen in Table 2 below:

Table 2. Categories of Student Learning Outcome Values

No	Value Range	Category	Interpretation
1	81-100	A.	Very good
2	61-80	B.	Good (B)
3	41-60	C.	Enough (C)
4	21-40	D.	Not enough (D)
5	0-20	E.	Very less (E)

Source: (Novita & Sundari, 2020)

Results and Discussion

The implementation of this research is located at SMA Negeri Balung Odd Semester Academic Year 2023/2024. The population of this study used all class XI students who studied geography subjects including classes XI.9, XI.10 and XI.11. Next, sample determination was carried out through a homogeneity test using the one way ANOVA method assisted by SPSS 25 using the replicate values in the previous chapter. After testing for homogeneity and proving to be homogeneous, it turned out that the sample was determined using a lottery or cluster random sampling method. Based on the sampling technique using the method that has been implemented, the results showed that class XI.9 was used as the control group, while class XI.11 was the experimental group.

a. The Influence of the Student Facilitator and Explaining (SFAE) Learning Model on Critical Thinking Ability

The posttest used to measure critical thinking skills is in the form of 5 descriptive questions adjusted to the indicators according to Ennis. The following results of the posttest average scores obtained by students are presented in Table 3:

Table 3. Posttest Mean Score for Critical Thinking Ability

		Descriptive Statistics			
		Minimum	Maximum	Mean	Std. Deviation
Experimental Class Posttest	36	50	100	82.36	10.986
Control Class Posttest	36	45	90	73.47	11.008
Valid N (listwise)	36				

Source: Data Processing Results, 2023

Based on the results of the post test, it shows that the experimental class obtained the highest score of 100 and the lowest score of 50, with an average critical thinking ability score of 82.36, meaning it was in the "good" category. Meanwhile, the control class got the highest score of 90 and the lowest score was 45 with an average critical thinking ability score of 73.47, meaning it was in the "sufficient" category. The following graph shows the posttest mean score for critical thinking skills per indicated in Figure 4.1.

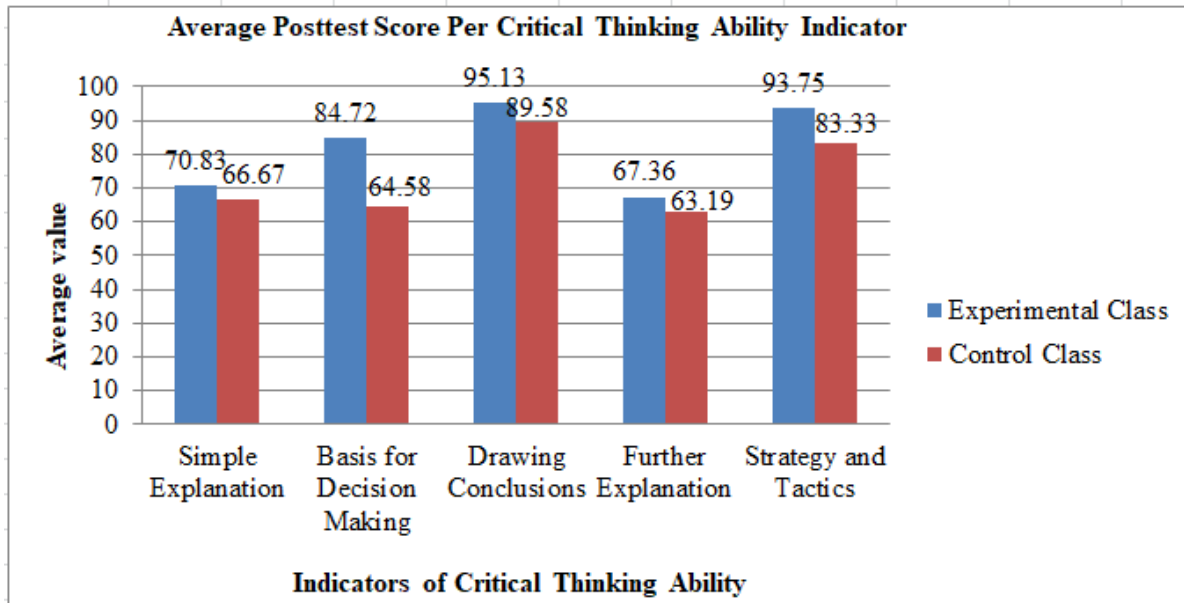


Figure 1. Graph of Average Posttest Values Per Critical Thinking Ability Indicator

Based on this figure, it shows that the average value per indicator of critical thinking ability of class XI.11 (experimental class) with the Student Facilitator and Explaining (SFAE) learning model shows superiority over the control group with the conventional learning model. The average value that has the smallest difference is the simple explanation indicator which is worth 4.16, while the further explanation indicator has a value difference of 4.17. The values that are significantly different are the basic indicators for decision making with a value difference of 20.48. Meanwhile, the highest value lies in the conclusion drawing indicator in the experimental class which is worth 95.13, but in the control class it is worth 89.58.

The use of the SFAE model carried out in class Apart from that, the SFAE model can create an active classroom, meaning that students are not observers but are also actively involved in the learning process, such as when expressing opinions, discussions and questions and answers. In line with the opinion of Rahma et al. (2021) that there is an influence of the SFAE model on students' critical thinking abilities because this model can make students' abilities increase and they can develop material independently, students are able to grow their knowledge and convey it to other friends.

The findings are based on simple explanation indicators, students are able to provide simple explanations using their own language from the basic material that has been taught. During ongoing learning, students enthusiastically answer questions from the teacher through their own opinions, thus creating an active classroom between teachers and students interacting with each other. Furthermore, regarding the basic indicators of decision making, the SFAE model encourages students to actively participate in learning. Through the role of facilitator, students must actively participate and interact with students in discussing and exchanging opinions so as to increase their understanding in making decisions. In addition, the problem-based LKPD presented helps students be more effective in improving their decision-making abilities. The next third indicator is drawing conclusions, students are directed to evaluate various information received, connect it and then be able to reach good conclusions with a higher level of thinking. Of course, in making the right conclusions, students need to properly

understand all available information and use it wisely in the relevant context and this is taught in the SFAE model.

Learning through the SFAE model has a more structured, effective syntax and the direction given by the teacher can increase meaningful understanding during the learning process. The fourth indicator is further explanation. Through the role of facilitator, students must actively participate in explaining concepts to other students so that this provides an opportunity to develop further explanation skills. Apart from that, students with the SFAE model look more active and enthusiastic during group discussions when faced with LKPD because there is a clear division of roles. Finally, the fifth indicator is that through the learning process using the SFAE model, students are required to take an active role in the learning process and share knowledge with other students. Of course, through this role the ability to plan and implement strategies to facilitate peer learning can be the key which is then reflected in increasing the value of strategies and tactics.

The next step is to carry out a normality test which aims to determine whether the data is normally distributed or not. Determining whether the distribution of data is normally distributed or not is seen on the basis of a decision if the Sig. > 0.05 then the data is normally distributed. Meanwhile, if the Sig. < 0.05 then the data is not normally distributed. This research carried out a normality test using Kolmogorov-Smirnov feature analysis in SPSS V.25 with the results shown in Table 4.

Table 4. Normality Test for Critical Thinking Ability

Class		Tests of Normality					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	f	Sig.
Critical Thinking Ability Posttest Score	Control Class	0.130	36	0.128	0.942	36	0.057
	Experimental Class	0.140	36	0.071	0.946	36	0.079

Source: Data Processing Results, 2023

Based on the results of the normality test in Table 4.5 regarding the critical thinking abilities of students in the control class, the Sig. 0.128 while the experimental class with a Sig. 0.071. These results show that the posttest scores for critical thinking skills are normally distributed because they are more than a significance value of 0.05 (Sig. > 0.05). Then proceed with the homogeneity test via the F test, while to see whether it has an effect or not, we use an independent test. sample T-test. Below are the results of the Fisher test and the independent sample T-test shown in Table 5.

Table 5. Independent Sample T-test of Students' Critical Thinking Ability

Independent Samples Test										
		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Critical Thinking Ability Posttest Score	Equal variances assumed	0.084	0.773	-3.429	70	0.001	-8.889	2.592	-14.058	-3.719
	Equal variances not assumed			-3.400	70.000	0.001	-8.889	2.592	-14.058	-3.719

Source: Data Processing Results, 2023

Based on the test results in Table 4.6, it provides information regarding the results of the homogeneity test using the Fisher (F) test and the influence test using the independent sample T-test. The homogeneity test results via the F test produce a Sig value. 0.773. This means that the data is homogeneous. Meanwhile, the influence test uses an independent, sample T-test which produces a Sig value. (2 - tailed) of 0.001.

b. The Influence of the Student Facilitator and Explaining (SFAE) Learning Model on Geography Learning Outcomes

Geography learning outcomes of this research are focused on cognitive levels C4-C6, namely analysis, evaluation and creation. The results of learning geography in the experimental class obtained an average value of 72.22, while the average value of 63.31 was obtained by the control class. Based on this, it shows that the score in the experimental class is in the "good" category because it has an average score of 72.22. Meanwhile, the control class described that the quality of the students' geography learning outcomes was also in the "good" category with an average score of 63.31. The posttest score for geography learning results in the experimental class (XI.11) obtained a maximum score of 100 while the minimum score was 40. Meanwhile for the control class (XI.9) the maximum posttest score was 93 and the minimum score was 27. These scores are different due to the learning model and learning factors different too. The following posttest scores on student learning outcomes are seen in Table 6.

Table 6. Posttest Scores on Student Geography Learning Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Experimental Class Posttest	36	40	100	72.22	13.478
Control Class Posttest	36	27	93	63.31	17.098
Valid N (<i>listwise</i>)	36				

Source: Data Processing Results, 2023

Next, looking at the cognitive aspect at levels C4-C6, it shows that there are differences in the average level of students' scores when answering the questions given. Levels C4-C6 are included in the cognitive realm of the HOTS level (higher level thinking). The following average values for cognitive levels C4-C6 are presented in Figure 2.

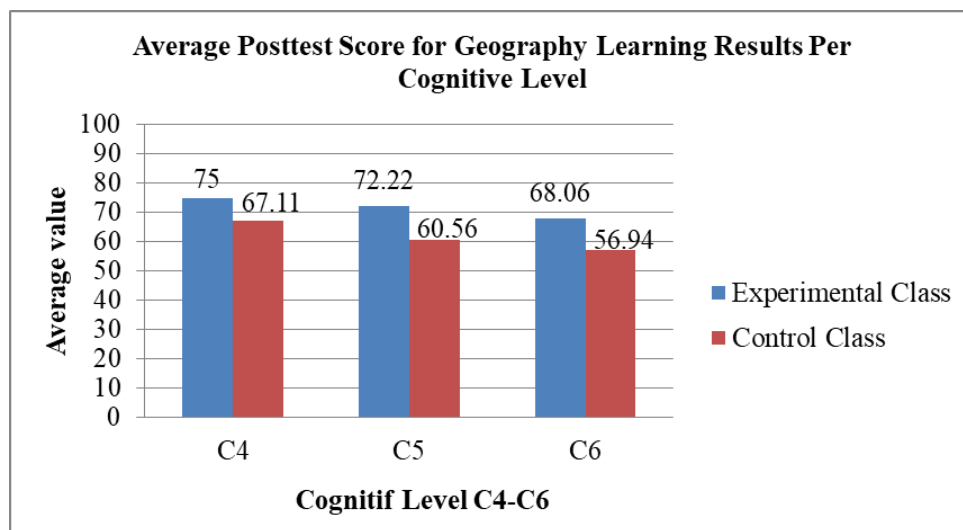


Figure 2. Posttest Scores for Geography Learning Results Per Cognitive Level

Based on the cognitive level of HOTS C4-C6 questions, the experimental class had the highest average score compared to the control class. The experimental class for cognitive level C4 had a mean score of 75 while the control class was 67.11, C5 cognitive level in the experimental class obtained a mean score of 72.22 while the control class obtained a score of 60.56. Finally, at cognitive level C6, the experimental class got a mean score of 68.06, while the control class got a score of 56.94. The average value is different because learning in the experimental class, students are directed to solve problems on the previous worksheet so that students can analyze, evaluate and create from the questions displayed with the correct answers. Moreover, students are also directed to create questions in the HOTS category, accompanied by the answers. The use of the SFAE model shows an increase in student learning outcomes because students are more active when expressing opinions to other students which then creates a confident and courageous attitude (Rahayu, 2019).

Next, a normality test is carried out to determine whether the data is normally distributed or not. The Kolmogorov-Smirnov method normality test can be seen in Table 7.

Table 7. Normality Test of Geography Learning Results

Tests of Normality							
Class		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Posttest Values for Geography Learning Results	Control Class	0.113	36	0.200	0.964	36	0.277
	Experimental Class	0.127	36	0.152	0.975	36	0.571

Source: Data Processing Results, 2023

Based on the table above, the posttest scores on geography learning outcomes for control class students found a data value of the Sig 0.200 and the experimental class data value of Sig 0.152. These results show that after the normality test, the posttest scores on students' geography learning outcomes were distributed normally. Furthermore, after the data was normally distributed, a homogeneity test and influence test were carried out as seen in Table 8.

Table 8. Results of the F Test and Independent Sample T-test of Geography Learning Results

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Posttest Learning Outcome Values	Equal variances assumed	2.726	0.103	-2.457	70	0.016	-8.917	3.629	-16.154	-1.680	
	Equal variances not assumed			-2.457	66.381	0.017	-8.917	3.629	-16.161	-1.673	

Source: Data Processing Results, 2023

Based on the test data listed in the table, it provides information regarding the results of the homogeneity test via the F test, which produces a Sig value of 0.103. The meaning of these results is that the data is homogeneously distributed based on decision making with a Sig value > 0.05. Meanwhile, the influence test using the independent sample T-test produces a Sig value. (2-tailed) of 0.016.

This research hypothesis is accepted because there is a significant influence of the Student Facilitator and Explaining (SFAE) learning model on students' geography learning outcomes. The existence of the SFAE learning model has been proven to be able to stimulate students' geography learning outcomes. The syntax in the SFAE learning model is more effective and structured through the directions given by the teacher so that it can improve understanding of the material. According to Harahap (2019), based on the results of his research, it shows that there is an increase in the learning outcomes of class X SMA students after implementing the syntax of the SFAE learning model correctly. The syntax of the SFAE learning model that has been implemented has prominent learning outcome indicators in the experimental class, namely at level C4 with an average score of 75 while in the control class it is 67.1. This indicates that students have succeeded in analyzing a problem.

CONCLUSION

Based on the results and discussion that have been described, the conclusion that can be drawn is that the Student Facilitator and Explaining (SFAE) learning model has a significant effect on students' critical thinking abilities as evidenced by the independent sample t-test (Sig 0.001 < 0.05). The posttest scores given also show that the class scores are higher compared to the control class which uses conventional learning models. The average value of the superior critical thinking indicator is drawing conclusions, while the lowest indicator is further explanation. Furthermore, the Student Facilitator and Explaining (SFAE) model has a significant effect on students' geography learning outcomes as proven through the independent sample t-test with a Sig value. 0.016 < 0.05. The most prominent cognitive level in the experimental group was level C4 with a mean of 75, while the low cognitive level was C6 with a mean of 56.94.

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