



The Effect of The Diorama Media-Assisted Core Type Operative Learning Model on Student Learning Outcomes

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ABSTRACT

This study aims to determine the effect of the CORE type cooperative learning model assisted by diorama media on learning outcomes in hydrofer material at SMA Negeri 5 Banda Aceh. This type of research is Quasi Experimental Design. The population of this study were all students of class X IS SMA Negeri 5 Banda Aceh. Sampling was done by purposive sampling technique, taken from class X IS 3 (experimental class) of 29 students and class X IS 2 (control class) of 29 students. Data collection techniques by giving tests to students, namely pre-test and post-test. Data processing techniques using the t test. The results of data processing obtained $t_{count} = 5.12$ and $t_{table} = 1.67$. According to the test criteria, H_a is accepted if $t_{count} > t_{table}$ at a significance level of 5% and $dk = (n_1 + n_2 - 2)$. Based on the calculation results obtained $t_{count} > t_{table}$ or $5.12 > 1.67$ it can be stated that H_a is accepted, so it can be concluded that there is an influence of the CORE type cooperative learning model assisted by diorama media on learning outcomes in SMA Negeri 5 Banda Aceh.

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INTRODUCTION

Education is a conscious planned effort for students to actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble morals and skills needed by themselves. Education is also used as one of the important aspects and used as a benchmark for the progress of a country, through good education can produce quality human resources (Murniati, 2020: 116).

The quality of education is a problem that is often faced in the world of education, this is due to the learning process that is still not effective. Teachers have a very important role in improving the quality of education. In teaching and learning activities, teachers are expected to create a pleasant and efficient learning situation in accordance with the subject matter of the learning material taught. Improving the quality of education in schools can be achieved in various ways, one of which is by improving the quality of learning, namely by applying an attractive learning model in order to achieve a learning goal.

Seeing the current learning conditions, teachers are highly required to have new skills or innovations in presenting the learning process, both through the use of models, approaches and learning methods that are able to foster interest and motivation in students to follow learning in class. Teachers are not only required to provide information to students to find or get new information outside the classroom learning process at school (Sriwahyuni, 2016: 2).

Interesting and suitable learning models can be chosen by teachers to improve student learning outcomes. With the existence of learning models, it is hoped that there will be good changes to student learning outcomes. The learning model is a pattern that describes the sequence or flow, the overall stages which are generally accompanied by a series of learning activities. The stages of a particular learning model clearly show what activities must be carried out by teachers and students (Lefudin, 2017: 174).

There are many innovative learning models that can be applied in the learning process. One of them is the CORE type cooperative learning model (*Connetting, Organizing, Reflecting, Extending*), which is active and multidirectional student-oriented learning. Calfee in (Pramita, 2015: 103) suggests that the CORE learning model is a model where the way discussions can influence the development of knowledge and connect old information with new information, organize a number of varied materials, reflect everything students learn and develop a learning environment. In the CORE learning model, there are also elements of expressing opinions, questions and answers between students and providing refutations.

The CORE learning model has four stages, namely connecting (*Connetting*), organizing (*Organizing*) new knowledge with old knowledge then rethinking the concepts learned (*Reflecting*) and expected students to expand their knowledge during the learning process (*Extending*). Indirectly, in the CORE learning model, students are invited to learn to increase the knowledge they already have, foster student curiosity.

Based on the results of initial observations at SMA Negeri 5 Banda Aceh on May 20, 2022, information was obtained that students' mastery of geography learning materials is still relatively low, there are still many students whose scores have not reached KKM (Minimum Completeness Criteria). The KKM set at SMA Negeri 5 class X is 70. This is evidenced by the learning outcomes of grade X IS 2 students from 30 students who participated in the initial research activity, there were 15 students who were declared incomplete, the test results showed the lowest score of 30 and the highest score of 70.

The learning that has taken place so far is that teachers have used learning models but are still rarely applied. Teachers more often use learning models that are dominated by lecture / expository methods, which are methods that are still teacher-centered. There are also some geography materials that are abstract or cannot be seen directly so that they are difficult for students to understand. The level of thinking of students is still at a low level, they have not been able to absorb abstract things. Geography is considered still abstract by students, because students recognize geography as a science that is still theoretical and in practice is still rote.

Responding to these problems, efforts need to be made to increase the use of student understanding in geography lessons. The presentation of learning in accordance with the characteristics of geography lessons that can help direct students to explore their potential. An effort that can be made is to apply the CORE type cooperative learning model. To support this CORE type cooperative learning model assisted by learning media using dioramas. Media diorama is an artificial scene of an object complete with something around it, the whole is made smaller than the original shape. Dioramas are usually used to describe events or a process so that those who see can be interested in understanding the contents contained in them (Niswah 2018: 10).

Samuhan, (2017: 56) Conducted a research entitled on the influence of the CORE type learning model on student learning outcomes in geography learning on hydrosphere material. Based on the results of his research, there is a significant difference between student learning outcomes in classes using the CORE learning model with the *direct* learning model. In student learning outcomes, the CORE learning model is higher with an average score of 19.23 compared to the direct learning model with an average score of 17.

Referring to previous research, which states that the CORE learning model can improve student learning outcomes. So researchers are interested in conducting a similar study entitled "The Effect of the CORE Type Cooperative Learning Model Assisted by Media Diorama on Student Learning Outcomes at SMA Negeri 5 Banda Aceh"

RESEACRH METHOD

This study used a quantitative approach. The type of research used is experimental research. This type of experimental research is *quasi-experimental design*. This research was carried out at State High School 5 Banda Aceh in the even semester of the 2023/2024 academic year. The inner population is all class X IS students at SMA Negeri 5 Banda Aceh consisting of 4 totaling 93 students. The sample of this study was class X IS 3 29 students as an experimental class and class X IS 2 29 students as a control class.

The sampling technique is *purposive sampling*. To find out whether there is an effect of the treatment given, tests are given when conducting experiments. The test in the study was in the form of 20-point multiple-choice questions given in both classes. First validated then shared when conducting pre-test *and* post-test. The validity of this research instrument uses the *product moment* correlation formula proposed by (Sugiyono, 2017: 228) as follows:

$$r_{\text{count}} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N(\sum X^2) - (\sum X)^2\} \{N(\sum Y^2) - (\sum Y)^2\}}}$$

Information:

$r_{\text{calculate}}$ = Correlation coefficient between X and Y

N = Number of respondents

$\sum XY$ = Number of multiplications between X and Y

$\sum X$ = Number of correct answers per question

$\sum Y$ = Correct answer for each respondent

$\sum X^2$ = The sum of squares of the correct answers to each question

$\sum Y^2$ = The sum of squares of each respondent's correct answers

Value test criteria If the calculated r value is greater than the table r ($r_h > r_t$), then the item is valid.

The reliability test in this study uses the KR 20 formula as follows:

$$r = \left(\frac{k}{k-1} \right) \left(\frac{V_t - \sum pq}{V_t} \right)$$

Information:

r = Overall instrument reliability coefficient

p = Subject proposition that answers the item correctly

q = Proposition of the subject answering the item incorrectly ($q = 1-p$)

$\sum pq$ = Number of multiplication results between p and q

k = Number of question items

V_t = Total variance

An instrument is said to be reliable if the value of the reliability coefficient is greater than or equal to the table r ($r \geq r_t$).

Documentation is a data collection technique by collecting and analyzing documents, both written, image, and electronic documents. Data analysis technique is an activity carried out to conclude the results of research after data is obtained from all respondents collected.

1. Initial Capability Analysis

The initial ability analysis aims to determine the initial ability of students from both research classes who were given a *pre-test* first at the beginning of the meeting before being given treatment. The *pre-test* value can first be tested with ANOVA statistics as follows:

$$F_h = \frac{MK_{ant}}{MK_{dal}}$$

Keterangan:

$F_h = F_{count}$

MK ant = Mean kuadrat antar kelompok

MK dal = Mean kuadrat dalam kelompok

Furthermore, after comparing the value of $F_{calculate}$ with F_{table} at the level of significance of 5%, the provision for testing the hypothesis is that if the value of $F_{calculate} < F_{table}$, H_0 is accepted and H_a is rejected, on the other hand, if the value of $F_{calculate} \geq F_{table}$, H_0 is rejected and H_a is accepted (Sugiyono, 2017).

1. Normality Test

The normality test uses *Chi Squared* statistics proposed by (Sugiyono 2017: 107) as follows:

$$\chi^2 = \sum_{i=1}^k \frac{(f_o - f_h)^2}{f_h}$$

Information:

χ^2 = *Chi Square*

f_o = Frequency observed

f_h = Expected frequency

The value of χ^2_{count} is then compared with χ^2_{table} for a significance level of 5%, with the test criterion being H_0 accepted or normally distributed if $\chi^2_{count} < \chi^2_{table}$ then H_0 is accepted and H_a is rejected, and if $\chi^2_{count} \geq \chi^2_{table}$ then H_0 is rejected H_a is accepted. If H_0 accepted means that the post-test data is normally distributed (Sugiyono, 2017).

1. Homogeneity Test

The homogeneity test is used to determine whether the research data group has the same variance or not. The formula used in the homogeneity test according to Sugiyono (2017: 140) is as follows:

$$F = \frac{\text{Varian Terbesar}}{\text{Varian Terkecil}}$$

$\leq F_{table}$ dan H_a diterima jika $F_{count} > F_{table}$ dengan taraf signifikansi 5 %. Jika H_0 diterima berarti data *post-test* homogen (Sugiyono, 2017).

2. Test the hypothesis

A hypothesis is a provisional assumption that must be proven. Hypothesis testing uses the *t-test model separated variant formula*, namely parametric statistics according to (Sugiyono 2017: 122) as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Information:

t = Price observed or calculated

\bar{X}_1 = Average experimental class score

\bar{X}_2 = Average value of the control class

S_1^2 = Experimental class variance

S_2^2 = Control class variance

n_1 = number of respondents in the experimental class
 n_2 = number of respondents in the control class

The test carried out is a one-party test, namely (the right party). In this connection (Sugiyono 2017: 103) states that the applicable test criteria are: "Accept H_a if $t_{\text{calculate}} > t_{\text{tabel}}$ and accept H_o if $t_{\text{calculate}} \leq t_{\text{tabel}}$ at the significance level of 5% and $dk = (n_1 + n_2 - 2)$ ".

RESULTS AND DISCUSSION

Research Results

Research Location

Location of SMA Negeri 5 Banda Aeh Astronomically located at $5^{\circ}34'30''$ LU- $5^{\circ}34'35''$ LU and $95^{\circ}21'78''$ BT- $95^{\circ}22'5''$ BT. While geographically, the location of SMA Negeri 5 Banda Aceh is in Gampong Kopelma Darussalam with the following boundaries:

1. The north side is bordered by the Ali Hasimy Auditorium
2. The south side is bordered by UPT Printing USK
3. The east is bordered by the USK Lecturer housing complex
4. The west side is bordered by SMP Negeri 8 Banda Aceh

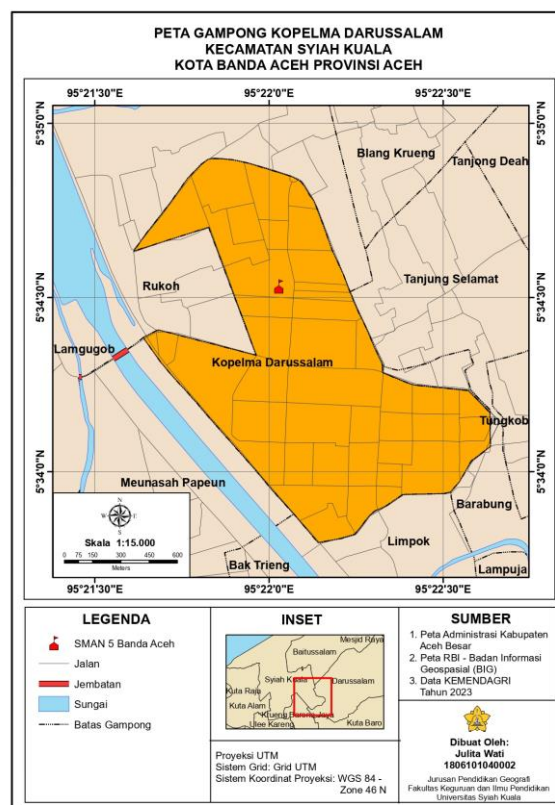


Figure 1. Gampong Kopelma Darussalam Administration Map



Figure 2. Floor Plan of SMA Negeri 5 Banda Aceh

The collected data is tabulated into a frequency distribution list. To calculate the mean (\bar{x}), Variance ($S^2\bar{x}$) and standard deviation (S) of the values of each group as follows:

Table 1.
Normality Test of Data Distribution in Experimental Class (X IS 3)

Interval	Class Limits (X)	Z-Score	Regional Boundaries	Regional Area (A)	Expected Frequency (F_h)	Observation Frequency (F_0)
57-62	56,5	-1,86	0,4686	0,0689	1,9981	4
	62,5	-1,28	0,3997			
63-68	62,5	-1,28	0,3997	0,1448	4,1992	5
	68,5	-0,69	0,2549			
69-74	68,5	-0,69	0,2549	0,2111	6,1219	3
	74,5	-0,11	0,438			
75-80	74,5	-0,11	0,0438	0,2246	6,5134	6
	80,5	0,47	0,1808			
81-86	80,5	0,47	0,1808	0,1746	5,0634	6
	86,5	1,06	0,3554			
87-92	86,5	1,06	0,3554	0,0941	2,7289	5
	92,5	1,64	0,4495			

Source: Research Results, 2023

With Z-Score = , where $= \frac{x-\bar{x}}{s} \bar{x}$ 75.638 and $S^2 = 105.6946$ and $S = 10.2808$ so that from table 1 above can be obtained:

$$\chi^2 = \sum_{i=1}^k \frac{(f_o - f_h)^2}{f_h}$$

$$\chi^2 = \frac{(4-1,9981)^2}{1,9981} + \frac{(5-4,1992)^2}{4,1992} + \frac{(3-6,1219)^2}{6,1219} + \frac{(6-6,5134)^2}{6,5134} + \frac{(6-5,0634)^2}{5,0634} + \frac{(5-2,7289)^2}{2,7289}$$

$$\chi^2 = \frac{(2,0019)^2}{1,9981} + \frac{(0,8008)^2}{4,1992} + \frac{(-3,1219)^2}{6,1219} + \frac{(-0,5134)^2}{6,5134} + \frac{(0,9366)^2}{5,0634} + \frac{(2,2711)^2}{2,7289}$$

$$\chi^2 = \frac{4,0076}{1,9981} + \frac{0,6413}{4,1992} + \frac{9,7462}{6,1219} + \frac{0,2635}{6,5134} + \frac{0,8772}{5,0634} + \frac{5,1579}{2,7289}$$

$$\chi^2 = 2,00 + 0,15 + 1,59 + 0,04 + 0,17 + 1,90 = 5,85$$

Based on the results of the calculation above, a $\chi^2_{\text{calculated}}$ value = 5.85 was obtained at a significant level of 5% and $dk = K-1 = 6-1 = 5$, then searched for in the chi-squared table obtained table = χ^2 11.070. The calculation results obtained a $\chi^2_{\text{calculated}}$ value $< \chi^2_{\text{the table}}$ or $5.85 < 11.070$ then the experimental class data is normally distributed.

Table 2.
Normality Test of Data Distribution on Control KelaS (X IS 2)

Interval	Class Limits (X)	Z-Score	Regional Boundaries	Regional Area (A)	Expected Frequency (F _h)	Observation Frequency (F _o)
43-48	42,5	-1,89	0,4706	0,0674	1,9546	3
	48,5	-1,30	0,4032			
49-54	48,5	-1,30	0,4032	0,139	4,031	6
	54,5	-0,72	0,2642			
55-60	54,5	-0,72	0,2642	0,2125	6,1625	4
	60,5	-0,13	0,0517			
61-66	60,5	-0,13	0,0517	0,2253	6,5337	5
	66,5	0,45	0,1736			
67-72	66,5	0,45	0,1736	0,1772	5,1388	5
	72,5	1,04	0,3508			
73-78	72,5	1,04	0,3508	0,0966	2,8014	6
	78,5	1,62	0,4474			

Source, Research result, 2023

With Z-Score = , where $= \frac{x-\bar{x}}{s} \bar{x}$ 61.845 and $S^2 = 105.162$ and $S = 10.2549$ so that from table 2 above can be obtained:

$$\chi^2 = \sum_{i=1}^k \frac{(f_o - f_h)^2}{f_h}$$

$$\chi^2 = \frac{(3-1,9546)^2}{1,9546} + \frac{(6-4,031)^2}{4,031} + \frac{(4-6,1625)^2}{6,1625} + \frac{(5-6,5337)^2}{6,5337} + \frac{(5-5,1388)^2}{5,1388} + \frac{(6-2,8014)^2}{2,8014}$$

$$\chi^2 = \frac{(1,0454)^2}{1,9546} + \frac{(1,969)^2}{4,031} + \frac{(-2,1625)^2}{6,1625} + \frac{(-1,5337)^2}{6,5337} + \frac{(0,1388)^2}{5,1388} + \frac{(3,1886)^2}{2,8014}$$

$$\chi^2 = \frac{1,0928}{1,9546} + \frac{3,877}{4,0310} + \frac{4,676}{6,1620} + \frac{2,352}{6,5337} + \frac{0,019}{5,1388} + \frac{10,167}{2,8014}$$

$$\chi^2 = 0,56 + 0,961 + 0,758 + 0,36 + 0,00 + 3,65 = 6,29$$

Based on the results of the calculation above, a value is obtained $\chi^2_{\text{count}} = 6,29$. To a significant degree 5% and $dk = K - 1 = 6 - 1 = 5$, then searched on the *chi-squared table* obtained $\chi^2_{\text{tabel}} = 11,070$. The calculation result is obtained value $\chi^2_{\text{count}} < \chi^2_{\text{tabel}}$ or $6,29 < 11,070$ then the control class data is normally distributed.

Homogeneity Test

The homogeneity test is carried out to determine whether the sample studied is homogeneous or not by comparing the two groups of variances.

Experimental class variants: 105,695

Control class variance: 105.162

$$F_{\text{count}} = \frac{\text{varian terbesar}}{\text{varian terkecil}}$$

$$F_{\text{count}} = \frac{105,695}{105,162} = 1,00$$

Based on the results of calculating the above variance, it is obtained $F_{\text{count}} = 1,00$ While value $F_{\text{tabel}} = 1,87$ with $dk = 29 - 1 = 28$. In accordance with the results of the above results, $F_{\text{count}} \leq F_{\text{tabel}}$ atau $1,00 \leq 1,87$ so that the H_0 result is accepted and it can be concluded that the *post-test data of the* experimental class and the control class have the same variant.

Test the hypothesis

The data that has been obtained is then processed using a *t-test*. Testing this hypothesis is done to find out whether the *post-test values* are relatively the same or different.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$t = \frac{75,638 - 61,845}{\sqrt{\frac{105,6946}{29} + \frac{105,1626}{29}}}$$

$$t = \frac{13,793}{\sqrt{3,644 + 3,626}}$$

$$t = \frac{13,793}{\sqrt{7,27}}$$

$$t = \frac{13,793}{2,69} = 5,12$$

Once obtained t_{count} , then further compared to t_{table} at DK ($N_1 + N_2 - 2$) or ($29 + 29 - 2 = 56$) with odds $(1 - \alpha)$ or $(1 - 0.05 = 0.95)$. By the test criterion is accept H_0 if $t_{\text{count}} \leq t_{\text{tabel}}$ and accept H_a if $t_{\text{count}} > t_{\text{tabel}}$ to a significant degree 5%. From the calculation results obtained $t_{\text{count}} = 5,12$ while $t_{\text{tabel}} = 1,67$. Then results are obtained $t_{\text{count}} > t_{\text{tabel}}$ atau $5,12 > 1,67$ mean H_a accepted dan H_0 rejected.

Based on the normality and homogeneity test shows that both classes are normally distributed and homogeneous, so it can proceed to prove the hypothesis. Test the hypothesis obtained value $t_{\text{count}} = 5,12$ with value t_{tabel} At the significant level $\alpha = 0.05$ (one-party test) with $dk = n_1 + n_2 - 2 = 56$ is 1.67 Furthermore, the calculation results show that the value $t_{\text{count}} = 5,12 \geq \text{nilai } t_{\text{tabel}} = 1,67$, so H_0 accepted and H_a rejected.

Discussion

This research was conducted at SMA Negeri 5 Banda Aceh which is a type of experimental research that examines directly to schools to see the effect of the *diorama* media-assisted CORE type cooperative learning model on student learning outcomes. This study used two classes, namely the experimental class and the control class. The experimental class was given a *diorama media-assisted CORE type cooperative learning model* and the control class was given a *PPT media-assisted CORE type cooperative learning model*. Before the learning process is carried out, first provide *pre-test*

questions to see the initial ability of students. The next step is that *the pre-test data* obtained is processed using the ANOVA test. The test results prove that the initial ability between the experimental class and the control class is the same.

The next step is to give treatment to the experimental class and the control class. Then give material to both experimental and control classes twice meetings then at the end of the meeting are given *post-test questions* which aim to see the results of student learning on the material that has been delivered. The *post-test* data were then tested for normality and homogeneity. Based on the normality and homogeneity test shows that both classes are normally distributed and homogeneous, so it can proceed to prove the hypothesis using the hypothesis test.

The results of the calculations that have been carried out can be explained from the average results that there are differences in student learning outcomes taught using *the diorama* media-assisted CORE learning model and the *PPT* media-assisted CORE learning model. Based on the results obtained, it can be concluded that the learning outcomes of students taught using the *diorama* media-assisted CORE type cooperative learning model are better than the learning outcomes of students taught with the *PPT* media-assisted CORE model in class X geography subjects of SMA Negeri 5 Banda Aceh.

The results of this study are supported by previous research conducted by Astari et al, (2020) Based on the results of this study, it can be concluded that there is an influence of the *CORE* learning model on student learning outcomes. It can be seen from the high learning outcomes using the *CORE* learning model that students are more interested in participating in learning. This shows how the influence of the *CORE* learning model on student learning outcomes compared to direct or conventional learning.

Another study that supports this research is conducted by Hidayati, (2017: 34) with the same media showing that in the results of calculations and data analysis obtained, it is concluded that the learning outcomes of students who do learning using diorama media are better than the learning outcomes of students who do learning without using diorama media in Science subjects.

The use of learning models in delivering learning materials can create an interesting, fun learning atmosphere and make students more interested in following the learning process and using diorama media can help teachers to show abstract forms to appear real on a small scale and easy to understand. Based on the results of this study and several previous studies, it can be concluded that the use of the *diorama media-assisted* CORE type cooperative learning model affects student learning outcomes.

CONCLUSION

The conclusions that can be drawn from the results of research and discussion in this study show that there is an influence of the diorama media-assisted CORE type cooperative learning model on student learning outcomes at SMA Negeri 5 Banda Aceh. This can be seen from testing the hypothesis using the t-test obtained t_{count} value = 5.12 with t_{table} value at a significant level $\alpha = 0.05$ (one-party test) with $dk = n_1 + n_2 - 2 = 56$ is 1.67 furthermore, the calculation results show that the calculated value = $5.12 \geq t_{\text{table}}$ value = 1.67, then H_0 is rejected and H_a is accepted. So it can be concluded that there is an influence on the use of the *CORE* type cooperative learning model assisted by diorama media and can improve learning outcomes, so that this learning model and media can be used as an alternative that can be applied in the learning process that can improve the learning outcomes of grade X IS SMA Negeri 5 Banda Aceh students.

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1. For schools, it is expected to be able to add learning media, especially geography learning media so that it can be used to improve student learning outcomes and also assist teachers in explaining learning materials.
2. For teachers, learning models and media should be used as alternatives to be applied in the learning process that provokes student activity, especially in hydrosphere dynamics material.
3. Other researchers who will conduct further research are expected to pay more attention to the models and media used in the material presented. In addition, further research can also make interesting and more varied media so as to improve student learning outcomes.

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