IMPLEMENTATION OF CASE BASED LEARNING TO IMPROVE STUDENTS' HIGHER ORDER THINKING SKILLS (HOTS) AT SMAN 1 BATIPUH

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ABSTRACT

Low student motivation in learning, lack of student learning outcomes, minimal student understanding of HOTS questions, and lack of student participation in learning. Teachers still use inadequate and monotonous learning models, such as implementing lecture-based learning models that make students feel bored, making the learning less effective and enjoyable. The study aimed to determine how much influence the application of case-based learning to improve students' higher-order thinking skills (HOTS) at SMAN 1 Batipuh. The quantitative research method is experimental. This research design uses a pre-test-post-test control group design. The study population was 143 class XI geography students at Phase F of SMAN 1 Batipuh 2024/2025. The sampling technique was purposive sampling. The sample in this study selected two classes, of which 1 class was used as an experimental class, namely XI geo four and XI geo two as the control group. Data collection techniques were observation, documentation, and testing. The research instrument is a test sheet in the form of an objectif (case study) with an assessment according to the criteria of the higher-order thinking skills (HOTS) category, such as analyzing, evaluating, creating, thinking critically, and solving problems. The data analysis technique uses statistical analysis to process the data obtained. The data obtained from this study were processed with the help of IBM SPSS 30 for the T and N-gain tests. The study results revealed that the application of case-based learning positively improves students' high-order thinking skills (HOTS) in geography subjects at SMAN 1 Batipuh, as seen from students' learning outcomes and learning activities. The results of this study are that there is an effect of the application of Case Based Learning on population dynamics problem material to improve Higher Order Thinking Skills (HOTS) of students in class XI Geo 4. The average post-test of the experimental class was 83.48 and the control class was 53.80. Data analysis using the Paired T-Test from the calculation data obtained a significance level (sig) of 0.001 because the significance is less than 0.05, so HO is rejected and Ha is accepted.

***Keywords**: Case Based Learning, Higher Order Thinking Skills (HOTS), Quality Education, Geography Learning, Population Dynamics Problem Material,*

ABSTRAK

Rendahnya motivasi siswa dalam belajar, kurangnya hasil belajar siswa, minimnya pemahaman siswa terhadap soal-soal HOTS dan kurangnya partisipasi siswa

dalam belajar. Hal ini disebabkan guru masih menggunakan model pembelajaran yang kurang memadai dan monoton seperti masih menerapkan model pembelajaran berbasis ceramah yang membuat siswa merasa jenuh dan bosan sehingga pembelajaran yang dilakukan berjalan kurang efektif serta kurang menarik. Tujuan penelitian untuk mengetahui seberapa besar pengaruh penerapan *case based learning* pada materi lingkungan dan kependudukan untuk meningkatkan *higher order thinking skills* (hots) siswa di SMAN 1 batipuh. Jenis penelitian kuantitatif metode eksperimen. Desain penelitian ini menggunakan pre-test - Post-test control group design. Populasi penelitian siswa kelas XI geografi Tahap F SMAN 1 Batipuh 2024/2025 berjumlah 143 siswa. Teknik pengambilan sampel purposive sampling. Sampel dalam penelitian ini memilih 2 kelas, yang mana 1 kelas dijadikan kelas eksperimen yaitu XI geo 4 dan XI geo 2 sebagai kelompok kontrol. Teknik pengumpulan data observasi, dokumentasi dan tes. Instrumen penelitian lembar soal tes berbentuk esai (studi kasus) dengan penilaian sesuai kriteria kategori kemampuan higher order thinking skills (HOTS) seperti menganalisis, mengevaluasi, mencipta, berpikir kritis dan memecahkan masalah. Teknik analisis data menggunakan analisis statistik untuk mengolah data yang diperoleh. Data yang diperoleh dari penelitian ini diolah dengan bantuan IBM SPSS 30 untuk uji T dan N-gain. Hasil penelitian mengungkapkan bahwa penerapan *Case Based learning* berpengaruh positif dalam meningkatkan kemampuan berpikir tingkat tinggi (HOTS) siswa pada mata pelajaran geografi di SMAN 1 Batipuh yang di lihat dari hasil belajar dan aktivitas belajar siswa. Hasil dari penelitian ini yaitu terdapat pengaruh penerapan *Case Based Learning* pada materi permasalahan dinamika penduduk untuk meningkatkan *Higher Order Thingking Skills* (HOTS) siswa di kelas XI Geo 4. Perolehan rata-rata *post-test* kelas eksperimen sebesar 83,48 dan kelas kontrol 53,80. Analisis data menggunakan uji Paired T-Test dari data hasil perhitungan diperoleh taraf signifikansi (sig) sebesar 0,001 karena siginifikansi lebih kecil dari 0,05, maka HO ditolak dan Ha diterima

Kata Kunci: *Case Based Learning*, *Higher Order Thinking Skills* (Hots), Kualitas Pendidikan, Pembelajaran Geografi, Materi Permasalahan Dinamika Penduduk,

A. Introduction

In Law No. 20 of 2003 which regulates National Education, it states that Article 3 of 2003 Law Number 20 concerning National Education helps develop skills and shape the character and civilization of the nation that is valuable in order to make the nation's life intelligent, have personality, be healthy, knowledgeable, capable, creative, independent, democratic, and responsible. Education is a conscious effort to realize a cultural inheritance from one generation to another. Until now, Education has no Limits to explain and explain the meaning of Education completely, because of its complex nature with its main target being humans (Rahman et al., 2022).

The quality of education is the main focus in efforts to improve the quality of human resources. Quality education can be obtained through various efforts, ranging from formal and informal education to improving the quality of the learning process and equal and adequate access. Good quality education pays close attention to the process of creating quality standards and how to achieve them, where these quality standards involve planning, control, and continuous improvement in the entire education process consistently (Hartini, et.al, 2025)

The concept of education in Indonesia which is still applied today is the result of Ki Hadjar Dewantara's thoughts. So he is nicknamed the "Father of National Education". He said that the meaning of education is a demand in the growth and development of a child, meaning that education guides all the natural powers that exist in a child, so that they become humans and members of society who can achieve the highest safety and happiness" (Pristiwanti et al., 2022). Education is also known as a humanism process, namely humanizing humans. This means that education is expected to help the generation that needs help and provide concern in every reaction of its changes towards maturity to form people who can think critically and have good morals.

Along with the development of information technology, education in Indonesia is also required to keep up with the times (Anwar, 2022). Indonesia has entered the 21st century, where education in Indonesia faces various challenges and opportunities that differ from era to era (Febriyanti, 2021). The needs of the 21st century as it is today require in-depth (cognitive) knowledge regarding a problem, event or incident (Yunus Abidin. et al., 2022). The 21st century is a century full of challenges. The biggest challenge in the world of 21st century education is the ability of the education system to prepare a generation equipped with the skills and readiness to face rapid, massive, and continuous changes (Dewantara, 2021). To improve knowledge, training, student equity, and student achievement, high-quality teachers are needed in today's world of education. To succeed in the 21st century, every citizen must be able to meet the demands of the times. Educators must teach students hard and soft skills to enter the world of work and compete with others (Novi, 2024). The abilities that should be in 21st century learning are not limited to reading and memorizing skills like most schools in Indonesia. The 21st century skills that the younger generation must have are critical thinking skills, creative thinking skills, and the ability to solve problems in everyday life (Anwar, 2022).

Learning in the 21st century allows technology-based learning which is increasingly rapid. The development of this technology encourages the emergence of various developments, including in the fields of learning and assessment. 21st century learning has its

characteristics and uniqueness, where learning in this century focuses more on 21st century skills. 21st century learning is designed according to 4C skills: Communication, Collaboration, Critical Thinking, Creativity, and Innovation (Rosnaeni, 2021). 4C skills are very important because they allow students to work together in groups by trying to solve certain problems, increase tolerance for differences of opinion with friends, think critically and creatively to solve problems related to life (Nawawi, et al. 2022). In this 21st century learning, students are more required to be mentally and knowledge ready to face any situation (Sartini, Rahmat, M. 2022). In line with this, to achieve the educational goals set by the Indonesian Government and respond to the demands of education in the 21st Century, Indonesia has implemented the Independent Learning Curriculum to replace the previously implemented 2013 Curriculum.

The Independent Curriculum is a comprehensive curriculum that offers various intracurricular learning opportunities. This curriculum gives students time to understand ideas, improve their abilities, and achieve the goals outlined in the curriculum (Wahyuni, N. K. D, 2024). This curriculum aims to improve educational capabilities in Indonesia through diverse intracurricular learning (Y. Hidayat, 2023). Implementing the Independent Learning Curriculum in Indonesia is an effort that can meet the demands

of 21st Century learning set by UNESCO. 21st Century education based on independent learning upholds the principles of efficiency, effectiveness, is student-oriented and considers the readiness, interest and learning needs of students in the classroom so that the learning carried out can achieve goals optimally (Wijoyo, 2018). The main objective of implementing the independent curriculum is to support improving the quality of student learning outcomes, especially in life values including innovation, creativity, independence and life skills that are starting to disappear due to the lack of abilities in students due to learning patterns that are not yet contextual. In addition, students are also very minimally faced with current problems, especially in geography learning. Geography is a science to support life throughout life and encourage life improvement. Geography is a science that studies natural phenomena and life on earth and the interaction between humans and their environment and their relationship to spatial and regional relationships or arrangements. Geography is a science that studies the similarities and differences in geosphere phenomena from a regional and environmental perspective in a spatial context (Lestari, 2020). Geography learning is learning about the spatial aspects of the earth's surface which are the entirety of natural phenomena and human life with a certain area (Wijayanti, et al. 2022). 21st century geography learning must be relevant

to the 21st century learning paradigm, which aims to improve understanding and develop students' abilities to act intelligently, wisely and responsibly when facing social, economic and ecological problems (Darini, et al. 2023). So to achieve the goals of 21st century learning, teachers are needed to improve students' high-level thinking or implement Higher Order Thinking Skills (HOTS) in geography learning.

Higher Order Thinking Skill (HOTS) is a way of thinking higher than memorizing or retelling what others have told. Implementing HOTS in the independent curriculum aims to improve critical thinking skills, creative thinking, arguing, constructing explanations, and making decisions in more complex situations (Rukminingsih, et al. 2023). According to Nofrion, et.al (2018) HOTS learning is characterized by; 1) Analysis, Evaluation and Creation, 2) Logistic Reasoning, 3) Consideration and Critical Thinking, 4) Problem Solving and Creative Thinking In its study, HOTS applies Bloom's taxonomy, namely C1 (Knowledge), C2 (Comprehension), C3 (Application), C4 (Analysis), C6 (Evaluation) (Karimaliana, et al. 2024). Higher-order thinking skills (HOTS) are those at the Bloom taxonomy level in the cognitive domain, which range from levels C4 to C6. At levels C4-C6, students must be able to analyze, evaluate, and create. However, students are still lacking in several areas, including conducting investigations, using media, procedures, understanding complex information, theory, analysis, and problem solving. So it is necessary to implement HOTS by fulfilling several indicators, including problem solving, critical thinking, and creativity. The implementation of HOTS-based learning in schools, especially in geography subjects, is expected to be adjusted to 21st century learning, namely improving abilities, skills, and attitudes that students must achieve due to the planned learning process. But the reality is based on observations at SMAN 1 Batipuh, which is located in Tanah Datar Regency, Batipuh Baruah District, Jl Padang Panjang-Solok KM 9, geography learning currently still requires special attention, because of the low motivation of students in learning, lack of student learning outcomes, lack of student understanding of HOTS questions and lack of student participation in learning. This is because teachers still use inadequate and monotonous learning models, such as still implementing lecture-based learning models that make students feel bored and tired, making the learning less effective and less interesting (Wahyuni, 2024). If this continues to be implemented, the school's geography learning objectives will not be achieved. Moreover, in the 21st century, understanding HOTS questions is very much needed to improve critical thinking skills, creative thinking, and problem-solving problems in everyday life. I propose a solution to overcome this by implementing the Case Based Learning (CBL) learning

model in geography learning at SMAN 1 Batipuh. Daryanto (2014) said that case-based learning is a learning approach that presents contextual cases to stimulate students to learn. Meanwhile, (Tan, 2003; Rusman, 2017) stated that case-based learning is an innovation in learning because in case-based learning it is the ability to optimize students' thinking methods through a systematic group or team work process so that students can empower, hone, test, and develop their thinking skills continuously. The Case Based Learning (CBL) model has several advantages: (1) Students can express cases or issues and use cases that relate to new situations. (2) Students can develop analysis, collaborate, and communicate skills. (3) Students are more involved in the learning process. (4) With case-based learning, students can develop group learning, speaking, and critical thinking skills (Trianto, 2011). By using the Case Based Learning (CBL) learning model, students will easily use their basic abilities in solving or solving cases given by educators in the learning process through group discussions according to the steps of the Case Based Learning (CBL) model, as well as students' conceptual understanding of learning materials will be maximized which is marked by students' activeness in solving cases through group discussions, where the teacher only functions as a facilitator and moderator in the discussion process so that students freely and freely develop their abilities in solving

factual cases presented by educators (Dewi, 2015). So the Case Based Learning (CBL) model emphasizes more that an educator in carrying out teaching must bring up activities, namely focusing teaching on the relationship between facts and providing new understanding to students, encouraging students to analyze, interpret, and practice the information obtained and encouraging students to exchange ideas with other students (Trianto, 2011).

This theory is proven by Bayu et al. (2020), which states that the form of learning in the 21st century can be implemented through the application of the Case-Based Learning Model. High-level thinking skills in geography learning are a basic ability that students must possess because they are related to the ability to assess a phenomenon spatially. The importance of high-level thinking skills is one of the important points that must be achieved in geography learning so that students can see, analyze and then describe existing phenomena.

B. Research Methods

According to Sugiyono (2019:2), the research method is a scientific way to obtain data with certain purposes and uses. This research approach uses a quantitative approach using the experimental method. This research design uses a pre-test - Post-test control group design. The population of this study was all students of class XI geography Phase F SMAN 1 Batipuh 2024/2025 totaling 143 students. This

study uses a sampling technique with purposive sampling. According to Sugiyono (2018:138) the purposive sampling technique uses several specific considerations according to the desired criteria to determine the number of samples to be studied. The sample in this study selected 2 classes, of which 1 class was used as an experimental class, namely XI geo 4 and XI geo 2 as a control group. Data collection techniques through observation, documentation and testing. This study divided the test implementation into two, namely pre-test and post-test. The initial test will be conducted before students are given population dynamics problem material using the case based learning (CBL) model in the experimental class and given to the control class without using the case based learning (CBL) learning model. While the final test is conducted after students learn the population dynamics problem material using the case based learning (CBL) learning model in the experimental class and the control class without the case based learning (CBL) learning model. This final test determines whether there is an effect after learning using different learning models. The research instrument the researcher uses is a test question sheet in the form of an essay (case study) with an assessment according to the criteria of the higher order thinking skills (HOTS) ability category such as analyzing, evaluating, creating, critical thinking and problem solving. The data analysis technique uses statistical analysis to process the data

obtained. The data obtained from this study were processed with the help of IBM SPSS 30 for the T and N-gain tests.

C. Results and Discussion
Results
HOTS Ability of Students at SMAN 1 Batipuh

Based on the question instrument, the average percentage of high-level thinking skills (HOTS) for all questions that were answered correctly by class XI Geography 4.

students of SMAN 1 Batipuh can be obtained, as can be seen in the table.

Table 1. Percentage of Students' HOTS Ability

No	Question Level	Percentage	Category
1	Apply (C3)	83%	Currently
2	Analyze (C4)	74%	Currently
3	Create (C6)	64%	Currently
	Average	**73,66%**	
	Category	**Currently**	

Based on table 1, overall, the high-level thinking skills (HOTS) of class XI Geography 4 students of SMAN 1 Batipuh are in the moderate category with a percentage of 74.67%. Based on each question in category C3, it is in the moderate category with a percentage of 83%, in category C4 it is in the moderate category with a percentage of 74%, and in category C5 it is in the moderate category with a percentage of 64%. To see the comparison of the percentages of each question with difficulty C3, C4 and C5, it can be seen in the picture.
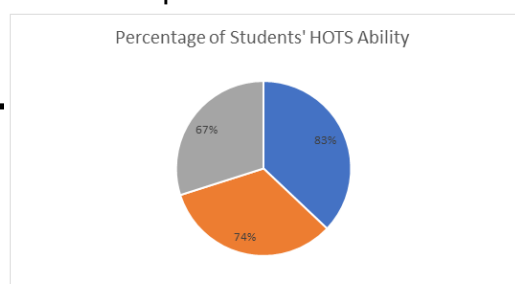

Percentage of Students' HOTS Ability

Figure 1. Percentage of Students' HOTS Ability

Based on Figure 1 above, it can be seen that students' high-level thinking skills (HOTS) in the indicator applying (C3) amounted to 26 people with a percentage of 83%, students in the indicator analyzing (C4) amounted to 23 with a percentage of 74% and students in the indicator creating (C5) amounted to 20 people with a percentage of 64%.

1. Cognitive Level Questions Level C3 (Applying)

The Case-Based Learning (CBL) learning method is applied in the learning process as an innovative strategy to encourage the development of students' high-level thinking skills (HOTS). CBL emphasizes the active involvement of students in analyzing and solving real or contextual cases related to the learning material. Through this approach, students not only understand the concept theoretically, but are also trained to apply their knowledge in real-world situations.

The application of CBL in this learning is evaluated through an assessment instrument in the form of questions designed at the cognitive level C3 (applying), one of the important components in the HOTS realm. Of the total 31 questions given, 9 questions are categorized at level C3. The results of the analysis showed that out of 26 students, 21 students answered all C3 questions correctly, while 5 other students made mistakes in answering questions at this level. Thus, the success rate of students in answering C3 questions reached 83%, which indicates that the majority of students have been able to apply their knowledge in relevant contexts.

This high percentage of success reflects that case-based learning is able to improve students' applicative thinking skills. Students are not only able to remember and understand concepts, but can also use them to solve complex problems. These results strengthen the evidence that CBL is effective in stimulating higher cognitive aspects, especially at the level of application (applying) which is the focus of evaluation in HOTS-based learning.

2. Cognitive Level Questions Level C4 (Analyzing)

The Case-Based Learning (CBL) learning method is an approach designed to train students' critical and analytical thinking skills through active involvement in solving real problems. CBL encourages students to identify, evaluate, and analyze information from various perspectives before making decisions or formulating solutions. This strategy is very relevant in efforts to improve Higher Order Thinking Skills (HOTS), especially in high-level cognitive domains such as C4 (Analyzing).

Evaluation of the effectiveness of the application of this method was carried out using an instrument in the form of evaluative questions. Of the

total 31 questions given, 12 questions were specifically developed to measure students' ability to analyze, according to the cognitive level C4 in Bloom's taxonomy. The results of the analysis showed that 23 students managed to answer the C4 questions correctly, while 8 students still made mistakes in answering questions at this level.

Based on these data, the percentage of student success in answering C4 questions was 74%. This percentage reflects that the majority of students have been able to demonstrate good information analysis skills, although there is still room for further improvement.

This achievement indicates that the application of case-based learning can actually improve students' analytical abilities. Through CBL, students are challenged to think more deeply, compare various possibilities, and draw conclusions from complex information. This is an important step in strengthening HOTS, where students are not only required to understand and apply, but also analyze and evaluate information critically.

3. Cognitive Level Questions Level C5 (Evaluating)

The application of the Case-Based Learning (CBL) method in learning aims to improve students' higher order thinking skills (HOTS), especially at the cognitive level C4 (analyzing) in Bloom's taxonomy. This method actively involves students in exploring and solving real cases that are relevant to the material, so that students are encouraged to think deeply, critically, and analytically.

In the context of this learning, students' HOTS evaluation is carried out using a question instrument designed with 31 questions, of which 12 questions represent the cognitive level C4, namely numbers: 8, 9, 17, 18, 19, 26, 27, 28, and 31. These questions are designed to assess students' abilities in identifying patterns, distinguishing information, constructing relationships between concepts, and drawing conclusions from data or problems presented contextually.

From the evaluation results, it is known that as many as 20 students were able to answer the C4 questions correctly, while 11 other students had not managed to answer correctly. Based on this data, the percentage of student success was 64% in answering questions at the analysis difficulty level (C4). This percentage indicates that most students have begun to be able to demonstrate the ability to evaluate information and make the right decisions, although there is still room for improvement. This achievement reflects that the implementation of CBL has made a positive contribution to the development of students' HOTS, especially in terms of evaluative skills which are essential in 21st century learning.

Hypothesis Test

1. N-gain Tes

The N-Gain test was conducted to provide a general overview of the increase in learning outcomes between before and after learning in class, the gain test was conducted on the pre-test and post-test of the experimental class, in this study the researcher used SPSS 30 to process the data.

Table 2. Experiment Class Pretest Posttest N-gain Test

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	34	-,12	1,00	,6335	,23911
NGain_Persen	34	-11,54	100,00	63,3545	23,91080
Valid N (listwise)	34				

Based on the table above, the pretest and posttest values of the experimental class can be seen that the average NGain score is 0.6335. In the range of score values 0.6335, it is in the medium value category, meaning its effectiveness is moderate. Then for the NGain percent, the average value obtained is 63.35, this value in the category of effectiveness interpretation in the form of a percentage is in the range of 56-75, which means that the use of a method or a treatment is quite effective.

Table 3. N-Gain Test of Control Class and Experimental Classes

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	67	69	-,26	1,00	,5612
NGain_Persen	67	69	-26,09	100,00	56,1196
Valid N (listwise)	67	69			

Meanwhile, in the pre-test and post-test values of the experimental class and control class, it can be seen that the average NGain score is 0.5612. The range of score values 0.5612 is in the medium value category, meaning its effectiveness is moderate. Then for the NGain percent, the average value obtained is 56.11, this value in the category of effectiveness interpretation in the form of a percentage is in the range of 56-75, which means that the use of a method or a treatment is quite effective.

2. T Test

Hypothesis testing is carried out After conducting normality and homogeneity tests, hypothesis testing can be used. The hypothesis in this study is that the application of the Case Based Learning learning model has an effect on the Higher Order Thinking (HOTS) of students at SMAN 1 Batipuh. The hypothesis test used in this study is a parametric statistical test, namely the Paired Sample T-test on the IBM SPSS 30 application, because it is used to compare the average of 2 related/paired groups with both samples receiving two different treatments. The following are the

results obtained from the Paired Sample T-test.

Table 4. Experimental Class T Test

Paired Samples Test

		Paired Differences					t	df	Significance	
					95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper				
Pair 1	Pre eks - PostE ks	-29,559	13,260	2,274	-34,185	-24,932	-12,998	33	<,001	<,001

Table 5. Experimental Class T-Test Statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PretesEks	53,76	34	15,192	2,605
	PosttestEks	83,32	34	10,173	1,745

Ha: There is a significant influence on the test scores of students' learning outcomes using Case Based Learning (CBL).

Ho: There is no significant influence on the test scores of students who use Case Based Learning (CBL).

The basis for decision-making is based on the calculated t value with the t table

If t table > t count, then Ho is accepted and Ha is rejected.

If t table < t count, then Ho is rejected, and Ha is accepted.

Based on the table about the t-test (paired sample t-test) above shows a significant difference between the results before and after the Case Based Learning (CBL) learning model. To see the t-table value is based on the level of significance

If the significance> 0.05, then Ho is accepted.

If the significance < 0.05, then Ho is rejected.

Based on the table, it shows that the significance is 0.001 < 0.05. Ho is rejected, and Ha is accepted, meaning that the hypothesis states that there is a significant difference before and after implementing the Case Based Learning model in improving students' higher-order thinking Skills (HOTS) in SMAN 1 Batipuh.

Table 6. T-test of Control Posttest and Experiment Posttest

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
Nilai	Equal variances assumed	1,039	,312	-5,562	67	,000	-14,838	2,668	-20,163	-9,513
	Equal variances not assumed			-5,574	65,956	,000	-14,838	2,662	-20,152	-9,523

The hypothesis test used in the table above is the independent sample t-test used to determine whether there is a difference in the average of two unpaired samples. The main requirement in the independent sample t-test is that the data is usually distributed and homogeneous (not absolute). From the analysis of the normality test and the homogeneity test, the conclusion is that the data is usually distributed and homogeneous. Based on the test results displayed in the table above, the Sig. (2-tailed) value is 0.000 <0.05, so there is a significant difference before and after implementing the Case Based Learning model in improving students' higher-order thinking Skills (HOTS) at SMAN 1 Batipuh.

Table 7. T-test statistics for control posttest and experimental posttest

	Group Statistics				
	Kelas	N	Mean	Std. Deviation	Std. Error Mean
Nilai	Posttest_Kontrol	35	68,49	11,893	2,010
	Posttest_Eksperimen	34	83,32	10,173	1,745

It can be seen in the table above that there is an average or mean value in the experimental class posttest of 83.32 and 68.49 in the control class posttest. This value can be interpreted as the average of the experimental class being higher when compared to the average of the control class. So, it can be concluded that there is a significant difference before and after the implementation of the Case Based Learning model in improving the higher-order thinking Skill (HOTS) of students at SMAN 1 Batipuh in the conclusion of the hypothesis above shows that the average learning outcomes of students using the Case Based Learning learning model are 83.32 while for conventional learning methods are 68.49.

Discussion

In this study, the application of Case Based Learning is able to improve students' high-level thinking (HOTS) as reflected in the students' learning outcomes adjusted to the previously designed question instruments. High-level thinking skills (HOTS) are measured using objective

questions that have previously been adjusted to high-level thinking indicators. High-level thinking is generally referred to as High Order Thinking Skills (HOTS). Krulik, Rudnick, & Milou divide thinking activities into 4, namely recall thinking, basic thinking, critical thinking and creative thinking. The assessment of high-level thinking (HOTS) is measured using high-level thinking indicators put forward by Benjamin S. Bloom in 1956 known as Bloom's Taxonomy, then this theory was revised by Bloom's own students, namely Krathwohl and Anderson. Krathwohl and Anderson changed the taxonomy to remembering C1, understanding C2, applying C3, analyzing C4, evaluating C5 and creating C6 (Sumaji. S, 2021). According to the new revised Bloom's taxonomy Anderson (2010) which is included in HOTS in the question category C4 (Analyzing), C5 (Assessing), and C6 (Creating) while the opposite of HOTS is LOTS which includes question categories C1 (Remembering), C2 (Understanding), and C3 (Applying).

Increasing high-level thinking indicators (HOTS) is implemented with the help of the Case Based Learning learning model as stated by Simbolon, D.H (Wospakrik, et al. 2020) Case Based Learning is an effective and interesting learning approach by involving students to be active and creative in discussions on real-life events (contextual) through the use of case studies to develop students' reasoning and skills in solving problems faced. The improvement of students' high-level thinking (HOTS) using the Case Based Learning model is illustrated from the designed question instrument. Before the question instrument was given to the sample class, the questions were first tested in a class outside the sample, then a validity and reliability test was carried out so that out of 40 questions, 31 questions were declared valid. So that out of 31 questions, there was an acquisition of the HOTS cognitive level with 29% of questions at the C3 cognitive level, 39% at the C4 cognitive level and 32% at the C5 cognitive level. Based on the high-level thinking (HOTS) indicator, it is known that the experimental class is superior to the control class. This can be seen from the average test score of students in the experimental class 83.48 and the control class 68.48. This difference is caused by differences in treatment in the learning process. The Case Based Learning learning model is applied in the experimental class and the control class applies teacher-centered learning. According to Wulan, R. et.al, (2024) the Case Based Learning learning model can also help students improve their high-level thinking skills through case analysis, students are able to identify problems, evaluate various solutions, and make the right decisions, so that the application of Case Based Learning can make students more interactive and contextual has increased student learning participation. They are more enthusiastic and interested in being involved in the learning process.

With the implementation of the Case Based Learning learning model, an increase in high-level thinking skills (HOTS) in class XI Geography 4 students of SMAN 1 Batipuh was obtained in the moderate category with a percentage of 74.67%. Based on each question in category C3, it is in the moderate category with a percentage of 83%, in category C4 questions it is in the low category with

a percentage of 74%, and in category C5 questions it is in the low category with a percentage of 64%. Overall, the average percentage of students' HOTS abilities is 73.66%, which is in the moderate category. This achievement shows that the use of the CBL model has had a positive influence on the development of HOTS in class XI Geography students. CBL has been proven to improve students' analytical and application thinking skills, although creative abilities still need to be improved with more exploratory and collaborative learning strategies.

According to Dimyati and Mudjino in Fitriani (2021: 279) that student learning participation includes willingness, willingness to listen, and participate when participating in the learning process. So to increase student learning participation in class, the Case Based Learning learning model is applied in the experimental class. Based on 3 types of student participation models, student participation in model 1 with the level of student participation in the experimental class tends to be in the "Medium" category, with a percentage of 53% while in the high category with a percentage of 16.6%, then for student participation in model 2 from 34 students, the level of student participation is in the limited category with a percentage of 41% and moderate at a percentage of 38%, which means that during learning they have good involvement in understanding the material. Based on the student participation model, the type of student learning in geography subjects in the experimental class is in the Collaborative Initiator type with a percentage of 35%, which means that they actively participate in discussions, work together in groups,

and encourage their friends to be involved in learning. Meanwhile, 24% of students are classified as Initiator Dominators, which indicates that they tend to dominate learning activities, both in discussions and in group decision-making. The application of the Case Based Learning model in the experimental class provides a more optimal increase in understanding compared to the control class. This is because the syntax in the model supports students to be active and creative in solving the problems they are facing. These steps include orienting the problem, participating in solving cases in groups, developing discussion findings, determining problem solving and communicating solutions. Case Based Learning makes students actively work together in groups to solve a problem/case. This is in line with the opinion of Syafira, (2022; 55) Case Based Learning is a learning model that trains students to investigate and solve problems from events/cases given through the use of case-based learning models. In addition, according to Simbolon, 2022 in (Salsabila, et.al, 2023) CBL can help develop effective learning, help develop interest in motivating them to participate actively, make learning easier and also strengthen students' understanding. The results of the study showed that there was an effect of implementing the Case Based Learning learning model on students' high-level thinking skills (HOTS). The Case Based Learning model is a learning model that creates an effective learning atmosphere, where the teacher's task is only as a facilitator and directs students to find solutions and solutions to existing problems. This is in line with the opinion put forward by (Tyas, et.al, 2020), the Case Based Learning

learning model is an effective model applied in learning because this model is in the form of an explanation of a particular problem, event, or situation, then students are assigned to find alternative solutions then this model can also be used to develop high-level thinking and find new solutions to a topic that is solved. In group discussions, students are given the task of analyzing arguments obtained by observing and understanding the problems given. By using the HOTS-based Case Based Learning (CBL) learning model, students are more active in finding new ideas when they encounter a problem or case, so that students can easily observe everyday events, find facts, use experience, apply knowledge, apply the relationship between material and facts. This makes students more adept at finding information through the facts they have found, thus improving students' contextual thinking skills. In addition, students' discussion skills improve after the HOTS-based Case Based Learning learning model is implemented, so that students are more active in discussing solving problems or cases that have been given (Fauziyah, H. N, et.al, 2020).

This study shows that the application of the Case Based Learning model has an effect on students' high-level thinking skills (HOTS) in geography subjects. This is because high-level thinking skills use the syntax of a case-based learning model that is able to train students' abilities in analyzing cases. In accordance with the syntax of the Case Based Learning learning model according to Azzahra, (2017) there are 7 stages of Case Based Learning learning, namely the stage of determining cases, analyzing cases, independently finding information,

data and literature, students determining steps to solve cases, making conclusions from the answers that have been discussed, making presentations and evaluations. At each stage, various aspects of high-level thinking skills (HOTS) will be involved, such as providing logical arguments and decision-making in finding the right solution so as to train students' high-level thinking skills. The learning process using a conventional model (lecture) is a learning model that emphasizes teachers and textbooks, most of which seem monotonous. This makes students feel bored, causing drowsiness and loss of concentration during the learning process. as expressed by Firmansyah (Rahma et.al. 2022) the boredom experienced by students during the learning process makes it difficult for students to concentrate on understanding the material presented by the teacher. Thus, the learning process must have elements of activity that make students feel happy and comfortable in following the learning process. Based on the description above, it can be concluded that the application of the Case Based Learning model can improve students' high-level thinking skills (HOTS) in geography learning at SMAN 1 Batipuh. This is reinforced by research conducted by Nugroho, et.al (2024) showing the results that Case Based Learning has an effect on students' high-level thinking skills in class VII of SMPN 1 Tapung Hulu where the test results showed that high-level thinking skills in the experimental class were higher than the control class. In line with the results of research conducted by Jamilah, et.al, (2024) which showed that the application of Case Based Learning had an effect on learning success and obtained a positive

response from students, this was evidenced by the average score of students in the experimental class being higher than the control class. based on the learning outcomes obtained by students, it can be seen that by applying Case Based Learning to the learning process, it can improve students' high-level thinking skills which are based on cooperation and active roles by teachers and students to achieve learning objectives. Based on this, it can be concluded that the application of the Case Based Learning learning model can improve students' Higher Order Thinking Skills in geography subjects at SMAN 1 Batipuh.

D. Conclusion

Based on this research, it can be concluded that the application of Case Based learning has a positive effect in improving higher order thinking skills (HOTS) assessed based on:

1. The ability to apply (C3) Students showed the highest ability at this level, with a percentage of 83%, including in the high category. This shows that the majority of students are able to use Geography knowledge and concepts in solving contextual problems presented in the form of case studies.

2. Analyzing Ability (C4) Students showed a percentage of 74%, included in the medium category. This achievement shows that most students have been able to decipher and connect information logically and draw conclusions from the data presented through geographical cases.

3. Creating Ability (C6) Students showed a percentage of 64%, included in the medium category, but lower than the previous two levels. This indicates that students'

innovative skills are still in the developing stage and require further strengthening through project-based learning and exploration of ideas.

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