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Implementation of E-Module Flip PDF Higher Order Thinking Skills to Improve Geography Learning Outcomes at Senior High School Level

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Abstract : This study aims to implement e-modules based on Higher Order Thinking Skills (HOTS) in geography learning at SMA 1 Terbanggi Besar, Central Lampung. The research method used was quantitative with a mixed method approach, involving 30 respondents from class X. The results showed that the implementation of e-modules can significantly improve students' learning outcomes. The results showed that the application of e-modules can significantly improve student learning outcomes, with 29 respondents obtaining high categories in N-gain. Although there are obstacles in implementing HOTS-based learning models, the results show that the use of digital media can encourage students' critical and creative thinking skills. This study recommends the integration of e-modules in the learning process to prepare students for the challenges of the 21st century.

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Introduction

Education is the main foundation in shaping the character and competence of individuals to face future challenges. One of the factors that greatly affects the success of education is the quality of the learning process. In an effort to improve the effectiveness of learning, various learning media have been used by educators around the world. Learning media has an important role in creating a learning atmosphere that is fun, interactive, and facilitates understanding of the concepts taught. (Herpratiwi, 2024) Competence is an absorption word from English, competence, which is also an ability. (Riswandi, 2019).

The 21st century requires each individual to have qualified hard and soft skills in order to prepare students to compete with other countries Hudda, (2016). Therefore, according to Trilling and Fadel (2009) every individual student in the 21st century needs to have skills including; (1) Learning and Innovation Skills, (2) Information, Media and Technology Skills, and (3) Life and Career Skills. In line with this opinion, the National Education Association (2002) states that there are 18 kinds of 21st century skills that need to be provided to each individual, one of which is Learning and Innovation Skills. These skills consist of 4 aspects known as 4C, namely, critical thinking, communication, collaboration, and creativity.

One of the 4C aspects, namely critical thinking, can be implemented through learning that is oriented towards higher order thinking skills or HOTS (Higher Order Thinking Skills). HOTS-oriented learning can be used as an alternative to face the demands of the 21st century (Dwijayanti, 2021). This is because HOTS-oriented learning will encourage students to be able

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to think critically in receiving various types of information, think creatively in solving a problem using their knowledge, research, argue well and be able to construct explanations, and make decisions in complex situations (Saputra, 2016). Thus, HOTS-oriented learning will help prepare critical and creative individuals who are able to meet the challenges and demands of the 21st century to improve their ability to compete globally.

The taxonomy formulated by Benjamin S. Bloom in 1956 has a cognitive domain with levels of thinking ability, ranging from low (lower order thinking skills - abbreviated as LOTS) to high (higher order thinking skills - abbreviated as HOTS). Based on the above, Sulianto (2018) presents a picture of the cognitive levels in Bloom's revised taxonomy in the following figure:

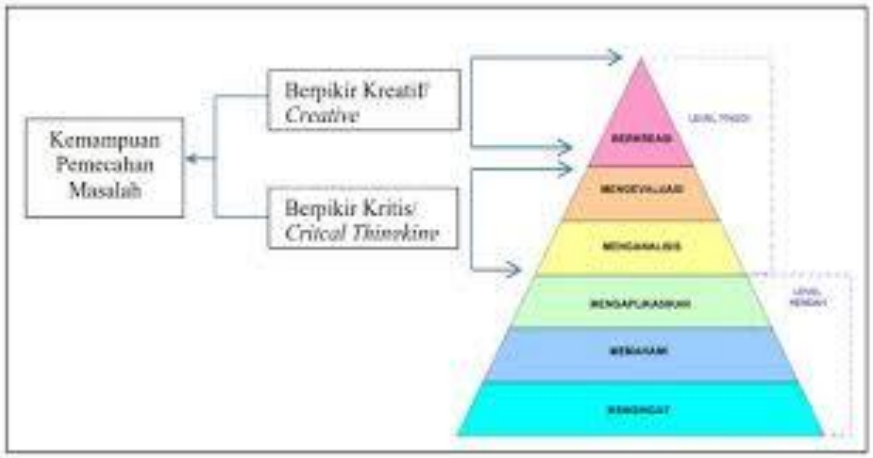

Figure 1: HOTS Cognitive Taxonomy

Figure 1 above shows that the HOTS level is at the critical thinking level in areas C4 and C5 and creative thinking in area C6. Creative thinking focuses on free thinking and imagination, and critical thinking involves an analytical process focused on proving, analyzing and evaluating arguments and facts gathered. These skills include the ability to develop new ideas and notions, look at problems from different angles, and explore alternatives to achieve better results. Based on this statement, critical and creative thinking processes are used to analyze problems or circumstances and find solutions using new ideas or concepts that have never been thought of before.

The fact in the field is that HOTS learning is still very constrained, especially in the learning process. The research study describes the difficulties of teachers and students in implementing HOTS learning due to the lack of relevant learning resources that are in accordance with the development of the 21st century. The results of further findings show that students are very difficult to receive information provided by the teacher through the lecture method.

Furthermore, teachers often use knowledge (C1), comprehension (C2), and application (C3) questions from textbooks and LKS to influence learners' higher order thinking skills. As a result, learners struggle to understand HOTS, evaluate arguments, make decisions based on critical thinking, and become less creative. Educators only train the knowledge (C1) and understanding (C2) aspects in this case, and little attention is paid to the analytical (C4) aspect. However, this analytical element is very helpful for learners' overall cognitive development, especially knowledge and understanding.

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Documents on students' geography learning outcomes confirm the tendency of students when given HOTS-based questions to get results that do not reach the minimum criteria, out of 30 students only 7 students are categorized as having HOTS thinking skills while 23 students are categorized as low. The findings confirm that geography learning at the high school level requires a learning innovation that includes the latest methods and learning resources.

Sutrisno and Budi (2016) argued in their research that there are several factors that cause successful learning. The factors in question include the following: learning methods, teaching materials or guidelines used by teachers, learning media, and teaching style. In addition, one of the successes of learning is the availability of learning facilities such as textbooks.

The solution to the problem of decreasing HOTS-based geography learning is to integrate digital-based media in the learning process in the form of teaching e-modules that are in accordance with the characteristics of learners, with the hope that the use of this e-module can help improve student learning outcomes. The results of Priyanti's research, (2022) suggest that the use of technology in learning in fact needs to be realized diligently, this is related to the progress of Indonesian education. Globally, technology in the world of education is a demand to improve the quality of education. In the 21st century, educational competencies must at least include "4K", namely, critical thinking, communication, creative and innovative, and collaboration. The function of media is to help clarify a process of delivering messages or information to improve achievement and facilitate the learning process. In addition, it functions to foster student learning motivation, grow experiences and abilities for students to be able to link learning with real life (Ernawati, 2022).

Modules are a set of teaching materials used in the learning process that are arranged systematically and structured to help students understand certain material or concepts. Maipita (in Nengsih, 2021) explains that currently, the Merdeka Curriculum teaching module is considered a quite crucial tool for the smooth implementation of learning with a new mode; or paradigm, especially if it is related to the transformation of the industrial and digital revolution. According to the Learning and Assessment Guidelines, the main purpose of developing teaching modules is to develop teaching tools. Teaching tools serve to guide educators to carry out learning by meeting several criteria that are in accordance with the needs of learner characteristics. (Nengsih, 2024).

Setyosari (2020). explains that teaching module development is a process used to develop and evaluate educational products. The development of teaching modules is carried out systematically and planned to produce quality and effective teaching modules in supporting learning. The characteristics of teaching modules according to Rosyid (Wibowo, 2018) are: (a) Self instructional, that is, through the module, a person or learner is able to learn on his own, does not depend on other parties, (b) Self contained, that is, all learning material from a competency is contained in one module as a whole, (c) Stand alone, that is, the module does not depend on other teaching materials and is not used together with other teaching materials, (d) Adaptive, which has a high adaptive power to the development of science and technology, is flexible to be used in various places and can be used within a certain period of time, (e) User friendly, which is friendly to the user. e-modules or electronic modules are modules in digital form, consisting of text, images, or both that contain digital electronics material accompanied by simulations that can and should be used in learning. (Muthadi, 2018). Based on this explanation, this research will implement the FLIP PDF Higher Order Thinking Skill E-Module to improve Geography Learning Outcomes at SMA Terbanggi Besar Lampung Tengah.

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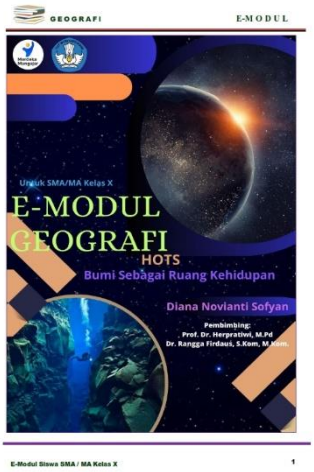
The results of Adella's research, (2024). obtained based on the need analysis, namely the lack of use of teaching materials that can help students and the low level of critical thinking in chemistry learning. Data on student learning outcomes were analyzed with One Sample T-Test on the SPSS 26.0 for Windows program with a significant level of 0.05 and obtained a Sig value <0.05, namely 0.000. The results of data analysis showed that the average student learning outcomes using the HOTS-integrated STEM e-module on reaction rate material were greater than 78. Furthermore, Ella's research (2023) with the title of developing economic e-modules based on Problem-based learning to improve HOTS shows the results of the success of E-Modules to increase students' HOTS thinking skills can be seen that the N-Gene Score and the average percentage obtained on small group and large group trials The development of Economic E-Modules based on Problem Based Learning to improve HOTS is expected to motivate further research.

Research Methods

This research is a quantitative study using a mixed method approach, while the population and samples used by researchers amounted to 30 respondents from class X SMA Negeri 1 Terbanggi Besar Central Lampung, this study uses the development product used by researchers in the form of HOTS e-Modules assisted by Flip Pdf Geography Subjects to Improve Student learning outcomes.
The following is a product display of the HOTS e-module



Link: e-modul https://heyzine.com/flip-book/a26eed2aa6.html

Figure 2 e-modules

Data analysis techniques to determine how effective the use of e-modules is by looking at the gain score value. The N-gain formula, which is based on the average normalized gain score, which is the ratio of the average gain score, is used to calculate the increase in students' understanding of geography material both before and after the class is normalized (N-Gain) (Hake, 1998) expressed by the following equation:

$$g = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

Description:

S_{post} = average Posttest Score
S_{pre} = average Pretest Score

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S_{maks} = maximum score

Meanwhile, the measurement of the N-gain level uses the following categorical interpretation:
Tabel 1 interprestase N-Gain

Interprestasi	Category
g < 0,30	Low
0,30 ≤ g ≤ 0,70	Medium
g > 0,70	High

Results and Discussion

Results

The research was conducted at SMA 1 Terbanggi Besar Central Lampung, including class X students totaling 30 students. The research itself was conducted during the process of teaching and learning activities carried out by researchers. The research took place 4 times a meeting with the following details:

Table 2 learning activities

Meeting	Activities
Meeting I	1. The teacher opens the lesson 2. The teacher presents the learning objectives of understanding the basic concepts of geography and digital maps. 3. Teachers develop critical thinking skills to analyze and evaluate the earth as a living space. 4. The teacher gives multiple choice questions in the form of pretest questions. 5. The teacher closes the lesson
Meeting II	The teacher opens the lesson : 1. The teacher introduces the HOTS e-module assisted by Flip Pdf Geography Subjects to students. 2. The teacher describes and outlines the learning. 3. Teachers and learners together analyze the learning case study. 4. 4. The teacher closes the lesson.
Meeting III	Teacher opens the lesson : 1. The teacher continues the previous discussion on meeting II. 2. Teacher and learners together implement the results of the case study analysis in the form of an in-class presentation. 3. The teacher closes the lesson.
Meeting IV	The teacher opens the lesson :

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1. Teachers together with students reflect on learning by using HOTS e-modules assisted by Flip Pdf Geography subjects.
2. The teacher gives multiple choice questions in the form of Posttest questions.

The results of the pretest and posttest of class X students along with the level of effectiveness of the development carried out by researchers are as follows:

Table 3 Average Pretest and Posttest Results

Description	Pretest	Posttest
Average	41	91,7
Improved	50,7	
Answer	30	

Source: Excel data

Based on the data from the pretest and posttest results in this study, it is known that at the time of the pretest the students' learning outcomes got an average result of 41.0%, while at the time of the final posttest assessment they got an average assessment of 91.7%. With an average change before and using the e-module of 50.7% of 30 research respondents. Furthermore, the effectiveness of the development was carried out by looking at the n-gain results as follows:

Tabel 4 hasil efektivitas pengembangan

No	Answer	Pretest	Posttest	N-gain Percent
1	Answer 1	35	85	76.92
2	Answer 2	55	90	77.78
3	Answer 3	40	90	83.33
4	Answer 4	55	90	77.78
5	Answer 5	40	90	83.33
6	Answer 6	55	85	66.67
7	Answer 7	60	100	100.00
8	Answer 8	55	100	100.00
9	Answer 9	55	95	88.89
10	Answer 10	25	90	86.67
11	Answer 11	35	95	92.31
12	Answer 12	40	95	91.67
13	Answer 13	35	85	76.92
14	Answer 14	30	95	92.86
15	Answer 15	55	95	88.89
16	Answer 16	35	90	84.62
17	Answer 17	35	90	84.62
18	Answer 18	45	95	90.91

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No	Answer	Pretest	Posttest	N-gain Percent
19	Answer 19	60	100	100.00
20	Answer 20	35	95	92.31
21	Answer 21	35	95	92.31
22	Answer 22	35	85	76.92
23	Answer 23	30	90	85.71
24	Answer 24	40	85	75.00
25	Answer 25	40	95	91.67
26	Answer 26	30	95	92.86
27	Answer 27	35	85	76.92
28	Answer 28	30	90	85.71
29	Answer 29	40	95	91.67
30	Answer 30	35	85	76.92

Source: data processed with spss

Based on data processing conducted by researchers using the SPSS V assistance program. 21, it is known that the interpretation of the development of HOTS e-modules assisted by Flip Pdf Geography subjects for class X SMA 1 Terbanggi Besar Central Lampung students is as follows:

Table 4 N-gain results

No	Categories	Total
1	Low	-
2	Medium	1
3	High	29

Based on the data, the N-gain data shows that there is 1 respondent with a medium category, while 29 respondents get a high category. The results showed that the implementation of the use of e-modules received a significant response. These results show that by applying HOTS-based learning e-modules, it can improve the geography learning outcomes of class X students of SMA 1 Terbanggi Besar Lampung Tengah.

Discussion

The obligation to educate the nation's children to become creative and capable human beings is explicitly stated in Article 3 of the Law of the Republic of Indonesia on the National Education System. In reality, the learning process has not been able to fully shape students to become capable, independent and creative. Several efforts have been made to achieve the proclaimed national education goals. One of them is the integration of higher order thinking skills (HOTS) in learning. The Minister of Education and Culture stated that in preparing students who are ready to compete in the millennium era and the industrial revolution 4.0, teachers must be able to provide conclusions or problem solving. (Sani, 2019).

The learning process in the 21st century and the industrial revolution 4.0 requires learning activities that lead to the development of critical thinking skills, using creativity in thinking, problem solving, communication, lifelong learning, self-management, new literacies

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such as technological literacy and much more than that, creative thinking, innovation skills, collaboration with others and leadership. (Agusta, 2021).

The results showed that HOTS-based learning combined with digital media had a significant impact especially for class X students of SMA 1 Terbanggi Besar Lampung Tengah, the research findings showed an average result of 50.7% of 30 respondents, when after being given an e-module. The effectiveness of the development is known that 1 respondent got a medium category while 29 respondents were in the high category, so it can be concluded that learning using HOTS-based e-modules can improve the geography learning outcomes of class X SMA 1 Terbanggi Besar Lampung Tengah students in geography subjects.

The results of research conducted by Rohman, (2024) with the title of the application of HOTS-based learning models in terms of knowledge and ability to package learning tools. shows The results of the first cycle show that PBL has not been fully successful in improving student learning outcomes. An in-depth evaluation of the understanding and application of PBL is needed. The second cycle recorded a significant improvement, with the average student assignment score increasing. Teacher reflections showed some obstacles, such as students' lack of attention and limited interaction between them. The implementation of PBL at SMK Al-Ishlah had a positive impact on students' HOTS skills. There was a significant shift in the distribution of students' mean scores between the first and second cycles. The PBL model, in accordance with its steps, based on the research shows that PBL can be an effective approach to improve the quality of learning at SMK Al-Ishlah.

Conclusion

The use of HOTS (Higher Order Thinking Skills)-based e-modules is proven effective in improving geography learning outcomes of grade X students at SMA 1 Terbanggi Besar, Central Lampung. The average student learning outcomes showed a significant increase after the implementation of e-modules. The implementation of HOTS-based learning model and digital media successfully improved students' critical thinking skills. This can be seen from the shift in learning outcome categories, where most respondents showed a high category in higher order thinking skills. This research recommends the use of e-modules and HOTS approach as an alternative in learning to prepare students for the challenges of the 21st century, as well as encourage the development of critical, creative, and collaborative thinking skills among students. Thus, this research shows that the integration of technology and innovative learning approaches can have a positive impact on the quality of education and learner learning outcomes.

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