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The Effect of Discovery Learning with Youtube Media on Student Cognitive Learning Outcomes on the Materials Environmental Change

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ABSTRACT

YouTube media can be utilized and implemented in learning at school by using technological capabilities in accordance with the times. Learning that uses the discovery learning model is more meaningful if collaborated with YouTube media. This study aims to determine the effect of the discovery learning model using YouTube media on students' cognitive learning outcomes on environmental change material in class X MIPA SMA Negeri 1 Rancah Ciamis in the 2022/2023 academic year. The research method used was a quasi-experiment with a nonequivalent pretest-posttest control design. The population in this study were all students of class X MIPA SMA Negeri 1 Rancah consisting of four classes with a total of 152 students. The samples used were X MIPA 2 class as an experimental class totaling 37 students and X MIPA 1 class as a control class totaling 38 students. The sampling technique was carried out by purposive sampling. Data collection techniques in the form of learning achievement tests totaling 30 questions. The instrument used is a learning outcome test on environmental change material. The data analysis technique used an independent t-test whose results obtained a significant value of 0.000 <0.05, so that there was an effect of the discovery learning model with YouTube media on student learning outcomes on environmental change material in class X MIPA SMA Negeri 1 Rancah in the 2022/2020 academic year. It is hoped that in further learning can use YouTube media to improve better student learning outcomes.

Keywords: Discovery learning, Learning outcomes, YouTube

Introduction

Education is something that all levels of society must achieve because education is one of the efforts to improve the results of human resources. Education is considered a center of excellence and an agent of change for the nation in bringing prosperity to people (Rachmawati et al., 2018). The overall educational process activities that take a role are between teachers and students. Teachers must play an active role in carrying out learning so that students can understand the material presented by the teacher. To realize this, it is necessary to have an effective and efficient learning process; the teaching and learning process involves various teacher activities that are directly related to students, and these activities contain learning objectives; apart from that, in the learning process, there must also be a reciprocal relationship between teachers—and educational students to achieve specific goals (Setyosari, 2017).

Learning activities between teachers and students are challenging to separate because the teacher is an educator, a transmitter of knowledge, and a distributor of knowledge. As a teacher, you must be able to balance technological updates so that students can learn more actively. Increasingly, technology is actually having a significant impact on education. Educators must do several ways to improve the learning process of students, namely by selecting learning models and learning media that are appropriate to the material to be delivered. A learning process is likely successful if educators can package learning optimally. Providing appropriate learning models can help students obtain good learning outcomes. Choosing the suitable learning model is one of the efforts to create an active, innovative, and independent learning atmosphere.

An appropriate learning model will impact quality learning outcomes. This requires educators who can apply learning models that suit the needs of the class. The incompatibility of the learning model implemented will reduce the quality of the learning itself. Then, an educator can improve by choosing a learning model that suits the learning needs of students.

Based on observations in the place that will be used as research at SMAN 1 Rancah in the provisions written in the lesson plan, the written learning model is the discovery learning model. Still, the learning process is dominated by the lecture method only. The lesson plan is written using the discovery learning model, but in reality, an educator needs to carry out the appropriate discovery learning syntax. Because discovery learning is student-centered learning, students who listen to the learning material feel bored and conclude that learning could be more enjoyable. It is known that the Minimum Mastery Criteria (KKM) in class X MIPA in biology is 75, but some students show that they have yet to be able to exceed the KKM score. It is a concern for teachers because in learning biology, students feel they need help understanding a material that is based on concepts, principles, and or expressing ideas in a biology material that causes a lack of student learning outcomes.

One learning model that can help students in the learning process is the discovery learning model. The difference between discovery learning carried out by teachers and researchers is that researchers want to perfect the use of discovery learning models and collaborate with YouTube media to attract students' interest in learning. The use of the discovery learning model applied in research sites could be better according to the syntax proven when conducting practical field experience, so researchers want to apply the discovery learning model to make it much better. The discovery learning model is a model that encourages students to ask questions and conclude principles or concepts obtained through examples of experience (Febrianti et al., 2021). The discovery learning model was chosen because it wants to make the discovery learning model that has been implemented better and has improvements; this model is believed to be able to make students more active in the learning process, increase student discovery by solving a material concept (Purwanti, 2022). By using materials on changes in the student's environment according to the conditions in the school environment and the surrounding environment by exploring many media on YouTube by realizing the concrete environment around them.

YouTube media will assist in the use of the discovery learning model to attract students' attention in carrying out the learning process. On YouTube media, explanatory videos related to environmental pollution material are shown, which can allow students to easily access videos by being given a YouTube link that educators have chosen. The use of YouTube media in the learning process can harmonize with the world of technology in modern times like today. Students are also allowed to bring their gadgets as learning facilities to help students get more leverage in learning.

The use of the discovery learning model using YouTube media will be able to take advantage of the progress of the times which can later be applied to the learning process (Pambudi et al., 2018). Not only are teachers required, but students must also be able to improve their learning abilities, which produce satisfying learning outcomes that YouTube media can assist. Because the use of YouTube media increases knowledge of technology, which is increasing day by day, teachers are required to be able to understand YouTube media. Utilization of YouTube media Based on the analysis of the problems and alternative solutions offered, educational research on the discovery learning model with YouTube media needs to be carried out to seek learning outcomes for class X MIPA students at SMA Negeri 1 Rancah.

Methods

This This study used a quasi-experimental design with a nonequivalent control group design. The population in this study were all students of class X MIPA SMA Negeri 1 Rancah, totaling four classes, a total of 152 students. The sample used a purposive sampling technique because the researcher has specific considerations when taking samples (Sugiyono, 2019). In this study, two classes were taken, with class X MIPA 2 as the experimental class and class X MIPA. 4 as the control class, each student numbering 38 people. The dependent variable in this study is learning outcomes, while the independent variable in this study is the discovery learning model with YouTube media. In the experimental class, the first meeting stimulated activities by showing a YouTube video with the link https://youtu.be/tJJACY_uY-Y and identifying problems from the video. If the explanation was incomplete, students were given a YouTube link again to listen to the explanation of the material via the link https://youtu.be/YUopPupUkGU, which is shown in class. For the second meeting, a link is provided: https://youtu.be/y2CLOnWsc-Q, https://youtu.be/-PPI-8DJI_4, and https://youtu.be/3h1NyNmyeaY.

The data collection technique used a written test with an instrument of learning outcomes on environmental change material given to the experimental and control classes with the type of multiple-choice questions totaling 30 questions. The cognitive aspects measured in this research are C1, C2, C3, C4, and C5. Data processing techniques were given to the pretest and posttest which were analyzed using the N-gain technique. The data analysis technique used the t-independent test to find out whether there is a difference in the means of two unpaired samples (Nuryadi et al., 2017), which had previously been tested using the normality test using the Kolmogorov-Smirnov test and the data homogeneity test using the Levene test. All data was tested using SPSS software.

Results and Discussion

Table 1 shows normality test data using the Kolmogorov-Smirnov test conducted in the experimental and control classes.

Table 1. Kolmogorov-Smirnov test data in the experimental class and control class

Test of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Learning Outcomes Students	Experimental Pretest	.127	37	.142	.937	37	.036
	Experimental Posttest	.132	37	.105	.936	37	.033
	Control Pretest	.101	38	.200*	.955	38	.134
	Control Posttest	.084	38	.200*	.970	38	.392

*. This is a lower bound of the true significance

a. Liliefors Significance Correction

Based on the data normality test using the Kolmogorov-Smirnov test in Table 1, it can be seen that the significance value of student learning outcomes taken from the experimental pretest data is 0.142, the experimental posttest is 0.105, the control pretest is 0.200, and the control posttest is 0.200. This value indicates that it has a significance level of > 0.05, so it can be concluded that Ho is accepted. It means that the pretest-posttest data on student learning outcomes is taken from a normally distributed population. Table 2 presents the data homogeneity test using the Levene test.

Table 2. Independent t-test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Learning Outcomes	Equal variances assumed	5.897	.516	2.651	148	.000	8.0298	3.0289	2.0443	14.0152
	Equal variances not assumed			2.644	140.316	.000	8.0298	3.0374	2.0249	14.0347

Based on the independent t-test shown in Table 2 states that the discovery learning model with YouTube media has a significant influence on student learning outcomes. The significance value of student learning outcomes is taken from the pretest-posttest value of 0.516. It is indicated by an essential value of 0.000, which is less than 5% or (0.000 <0.05), so it can be concluded that Ho is rejected, namely, there is an influence of the discovery learning model with YouTube media on students' cognitive learning outcomes.

Figure 1. YouTube video showing about environmental change

The use of the discovery learning model with YouTube media in the experimental class makes it easier for students to understand the learning material presented because there is an intermediary media used. Learning in the experimental class went well and smoothly; students were able to listen to the teacher's explanations well. Media is very important in science learning so that the learning process is more lively. Learning activities using media make something abstract become real in class and more quickly captured by the five senses of students (Fatmawati et al., 2018). With YouTube media, students will feel energized because the YouTube media itself includes audio-visual, namely media that involves sound and images, which have better abilities when used as learning media. After all, it includes auditive (listening) and visual (seeing) media (Rahmasari, 2021).

While the advantages of using YouTube media in experimental classes are that students can increase active interaction between students and teachers or students with students, an active and conducive learning atmosphere does not saturate students in the process of learning activities. As for the use of YouTube media, there are several advantages found in students in the experimental class, namely, students can increase active interaction between students and teachers or students and students, and an active and conducive learning atmosphere does not saturate students in the process—study activities. Students can more easily understand information if it is delivered using YouTube media, which can improve student learning outcomes (Haryadi, 2019). The obstacles found during the research were that there were still students talking in the classroom by discussing the material being studied. Not all students could access YouTube due to limited quota, so other students shared the opportunity to watch YouTube (Yuliana et al., 2020).

YouTube, using the discovery learning model, can increase student learning activities. The discovery learning model can build knowledge based on prior knowledge possessed by students so that later students can have a deeper understanding (Kristin, 2016). The existence of the discovery learning model can improve student learning outcomes, and the level of thinking of students can develop so that it can increase the competence of students especially when combined with the use of YouTube media (Khamidah et al., 2019).

This influence is because the discovery learning model with YouTube media can improve the learning process so that students can be more interested in learning, which will produce maximum learning outcomes. The discovery learning model provides free opportunities for students to learn to carry out activities in studying the material; students are allowed to develop their learning strategies or interact and negotiate with fellow students and teachers, which makes students in learning not feel pressured and anxious (Asmara & Afriansyah, 2018). Learning using the discovery learning model requires high curiosity and learning motivation from each student (Rahman & Maarif, 2014).

The use of the discovery learning model for students requires adequate media to support their learning needs so that their learning process runs smoothly. The use of learning

media also requires adjustments to the material or learning model being implemented. One of the media that can be used with the discovery learning model is YouTube. Students can understand more about the material presented if they use YouTube as a learning medium by looking at the video content found on YouTube (Wardana et al., 2022).

The role of the teacher is that the teacher must be able to create more enjoyable learning to enable students to have better learning outcomes compared to conventional learning (Delfisanur et al., 2020). So that teachers must be able to take advantage of existing technology to be implemented to students. The benefits of YouTube for the learning process are conveying learning material, providing illustrations of learning material, and providing tutorials on practical material. An attractive display will motivate students to take part in learning, add insight into knowledge, solve problems on subject matter issues, and get diverse information helpful in learning (Sutarti et al., 2021).

The acquisition of student learning outcomes is found from the pretest-posttest results of students in the experimental class and control class. At the time of the pretest, students found it challenging to work on the questions that had been given on the Google form because the problem was that the teacher had missed the material. The purpose of the pretest is to find out the extent to which students' cognitive abilities are related to environmental change material if the teacher has yet to behind the material. But when learning activities take place using the discovery learning model with YouTube media, students look excited and actively ask and answer because the teacher displays YouTube videos that are relevant to the learning material being discussed.

In the results, there is an average score of students obtained from the pretest-posttest. The experimental class has a higher score than the control class because the experimental class is given treatment in the form of providing YouTube media displayed on the infocus screen so that students listen to the video played by the teacher. The success rate of students is measured by the learning outcomes achieved by the students themselves (Hasibuan et al., 2021). A comparison of the pretest-posttest average scores along with the N-gain of student learning outcomes in the experimental class and control class can be seen in Figure 1.

The n-gain results from the experimental class and the control class are both in the moderate category. However, the n-gain value in the experimental class is higher than the n-gain value in the control class which has a difference (0.21). It shows that the experimental class has good treatment in learning by finding solutions using YouTube media as a learning tool combined with the discovery learning model. A milestone in the success of students in learning is a teacher who can choose learning models and learning media that are implemented for students so that students can improve cognitive process skills, produce fun learning, and strengthen memory (Winarti et al., 2021).

Table 3. Comparison of the average scores of the experimental class and the control class

	Pretest	Posttest	N-Gain
Experiment class	17,4	29,8	6,1
Control Class	16,53	25,83	4,0

Based on the description above, the independent t-test is used to determine whether there is a difference in the means of two unpaired samples. The N-Gain test aims to evaluate the effectiveness of using a particular treatment in one group pre-test and post-test design research or research using a control group. The discovery learning model with YouTube media can affect student learning outcomes compared to using the discovery learning model alone. Before there was treatment in the learning process, students had low learning outcomes. Still, after treatment using YouTube media, students had the enthusiasm to want to find out more about environmental changes, as evidenced by increased learning outcomes. By using the

discovery learning model with YouTube media, students can get learning that is useful, fun, and active in asking and answering. Not only is the concept obtained, but the audiovisual media is obtained because of using the YouTube media. Therefore, using the discovery learning model with YouTube media is considered a good model that can improve student learning outcomes. Moreover, the use of adequate press can be used during the learning process. The learning media used will provide an accurate picture to students, helping teachers in teaching and learning activities (Ulya et al., 2021).

Conclusion

Based on the results of the research and data analysis that has been carried out, it can be concluded that there is an influence of the discovery learning model with YouTube media on student learning outcomes on environmental change material in class X MIPA SMAN 1 Racah for the 2022/2023 Academic Year. It is shown by testing the hypothesis that the results of the analysis are Ho rejected, which obtains a value of 0.000 <0.05 so that from the research that has been done that the use of the discovery learning model with YouTube media can improve the quality of student learning outcomes.

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