

## **Discovery Learning : Implementation In Social Learning Assisted Interactive Digital Teaching Materials To Improve Student Learning Outcomes**

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### **Abstract**

The use of teaching materials in social studies is very important because it can increase effectiveness in improving student learning outcomes. This study aims to determine the effect of the use of interactive digital teaching materials in social studies learning with discovery learning model on student learning outcomes SMPN Nilau Tapan South Coastal District, West Sumatra. This quasi-experimental study used a posttest-only group design. Sampling using purposive sampling technique. The results of this study indicate that there is a significant effect of the application of interactive digital teaching materials with discovery learning model on student learning outcomes. Thus, the use of interactive digital teaching materials with discovery learning models can be used by teachers to accommodate students' cognitive abilities so that student learning outcomes can increase.

**Keywords:** *Interactive Digital Teaching Materials Discovery Learning Model, Learning Outcomes*

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## **INTRODUCTION**

Principles of social studies based Permendikbud no. 22 of 2016 on the standards of primary and secondary education processes, learning is recommended to utilize information and communication technology to improve the efficiency and effectiveness of learning (Ministry of Education and culture, 2016). Information and communication technology can be a medium of learning. According to Ramadhani, Mulyani, and Utomo (2016) instructional media can train students to learn independently and motivate to evaluate the material that has been delivered by teachers, instructional media are able to provide feedback to users so that deficiencies in understanding the material can be overcome. Several studies have shown that media is instrumental in achieving student learning goals (Anjarwati, Winarno, & Churiyah, 2016; Lin & Wu, 2016; Oyedele, Rwambiwa, & Mamvuto, 2013; Purwono, Yutmini, & Anitah, 2014). Learning Media is needed for students so that they can explore the surrounding environment so that theoretical learning can be more realistic (Widiyawati, 2017). Computers as learning media have a high enough effectiveness because they are able to combine and present text, graphics, audio, moving images (video and animation) by combining links and tools that allow users to navigate, interact, create, and communicate in the same time and place (Anwariningsih & Ernawati, 2013; Firdaus, Damiri, & Tresnawati, 2012). The use of computers in learning media can provide representative material, so as to foster student motivation. However, not all learning materials can be delivered in the same method. As well as the IPS learning materials that have their own characteristics in the presentation. The material in social studies lessons that are considered difficult by some students to understand is light and optical equipment (Suradnya, Suyanto, & Suana, 2016; Hayati, Budi, & Handoko, 2015). Light matter consists of some material that cannot be observed directly such as the process of shadow formation, making it difficult for students to understand the concept. Students use imagination to be able to further deepen their knowledge, for example to see the

path of light in the process of shadow formation, so that learning media are needed in the form of teaching materials that are not only textbooks, but from various other sources such as information and communication technology that can be accessed at any time (Harsono, Soesanto, & Samsudi, 2009). One of the Learning media that can help the visualization process and solve the problem is interactive digital teaching materials. The development of interactive multimedia learning media facilitates student learning in solving problems (Wardani, Mudzalipah, & Hidayat, 2013). The use of interactive digital teaching materials in learning makes students interested in learning because of the visualization that can encourage students to understand the material provided (Sutarno, 2011).

The use of interactive digital teaching materials in accordance with the 2013 curriculum that requires teachers to use information and Communication Technology in learning. According to Hayati, Budi, and Handoko (2015) the use of teaching materials in physics materials can improve student learning outcomes. According to his letter, Suyanto, and Suana, (2016) interactive digital teaching materials can help students understand concepts that cannot be visualized such as in light materials and optical devices, so that they can be a support in the learning process in the classroom or as a means of independent learning by students. This teaching material can make it easier for students to understand abstract concepts in light materials and optical devices and obtain maximum learning outcomes. The use of Interactive multimedia has a positive impact on students ' mastery of concepts in learning (Gunawan, Harjono, & Sutrio, 2015; Husein, Herayanti, & Gunawan, 2015).

Several other studies also show that the use of video in learning has a positive impact and can improve student learning outcomes (Izzudin, Masugino, & Suharmanto, 2013 ; Busyaeri, Udin, & Zaenuddin, 2016; Iwantara, Sadia, & Suma, 2014; Fadhashar, Indriyanti, & Lisdiana, 2017). The use of video as a learning medium can increase student motivation because the abstract material video can be more real and can be observed well. With high motivation students do not need to be forced to think. Students enjoy an interesting learning process so that the level of thinking of students will further develop. The level of students ' thinking must continue to be developed so that students can achieve high-level thinking skills (Nurwahidah, 2018). High-level thinking skills correspond to the learning objectives in the 2013 curriculum. Learning by using Learning media produces a better average than using conventional lecture media (Harsono et al., 2009). In addition to supporting learning media, teachers must also choose effective learning models in empowering student competencies. Druckman and Ebner (2017) state that Discovery Learning makes learning more effective so as to improve students ' understanding of concepts. Hayati and Berlianti, (2016) stated that discovery learning can improve learning activities and outcomes. Dewi, Nurmilawati, and Budiretnani, (2017) also stated that discovery learning can improve students ' science literacy. Thus combining interactive digital teaching materials using the discovery learning model is expected to help students achieve maximum learning outcomes. Previous research has suggested that interactive digital teaching materials and discovery learning can improve student learning outcomes (Hayati, Bintari, & Sukaesih, 2018; Supriyanto, 2014). The results of Hakim and Windayana's research, (2016) show that the use of interactive multimedia can improve the social learning outcomes of SMPN Nilau Tapan students. The results of Kurniawati and Nita's research, (2018) show that interactive multimedia-based learning media can improve students ' understanding of concepts. The results of Supriyanto's research, (2014) show that discovery learning improves student learning outcomes. The results of the study Fitri and Derlina, (2015) showed the discovery of learning effect on student learning outcomes material temperature and heat. Previously researchers still have obstacles in learning by using discovey learning, the first in the design of creative media display still needs to be done so that students do not feel

quickly saturated and to increase the power of reasoning and imagination of students in the learning process (Hayati et al., 2018). Second, in discovery learning Learning students are still less involved in creative thinking and less active and teachers have not been able to manage time well so that learning can be effective with a relatively short time available. Based on the description, innovation is needed in learning using interactive digital teaching materials and discovery learning. The novelty of this study is the use of interactive digital teaching materials with discovery learning model to improve student learning outcomes with a relatively short time and make students more active in learning. The purpose of this study was to determine the effect of the use of interactive digital teaching materials with discovery Learning model to improve student learning outcomes SMPN Nilau Tapan Class VIII

## RESEARCH METHODS

This type of research is quasi-experiment research and using posttest-only group design. This design was implemented to investigate the effect of the use of interactive digital teaching materials in social studies learning with discovery learning model on student learning outcomes.

The initial stage of this research is to prepare research instruments such as syllabus, lesson plans, teaching materials, and evaluation questions. The syllabus is structured through several steps, namely the identification stage of subjects, formulation of KI and KD, determination of subject matter, selection of learning activities, determination of indicators, and assessment in the form of instruments. The lesson plan used in the study was made based on the material on KD 3.12 Class VIII about light and optical devices with discovery learning model. The teaching materials used are interactive digital teaching materials. Teaching materials are prepared through several steps, namely the design of teaching materials by selecting and creating teaching material formats and compiling teaching materials using 3D flipbook professional.

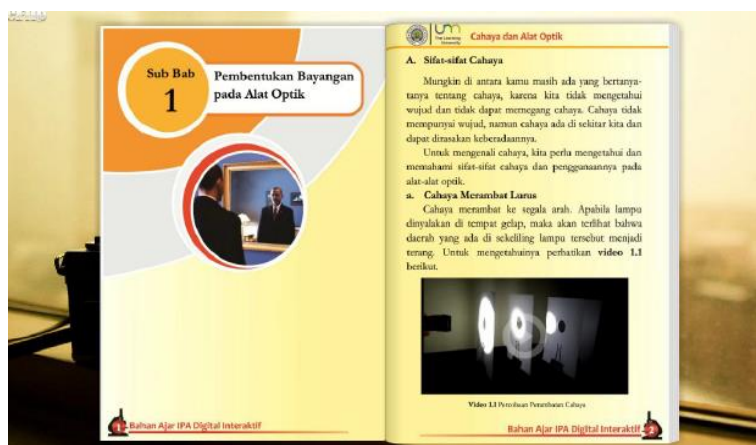
## RESULT AND DISCUSSION

Interactive digital teaching materials used contain light and optical learning materials, experimental videos, practice questions that allow students to fill in the answers in the fields provided. Questions are raised after the display of experimental material or video so that students read the material and observe the video first. One of the advantages of this interactive digital teaching material, in addition to questions in the form of options there are also questions that allow students to type a description of the answer in the column provided after the correctness of the answer can be directly checked with the “check answer” menu option below it. Students can explore their knowledge and pour in the answer column provided under each question in each discussion. After knowing the correctness of the answer, the student can also see the correct explanation of the question. That way the teaching materials used are more interactive with students. The front view of the interactive digital teaching materials used is shown in Figure 1.



Figure 1. Front page of interactive digital teaching materials

Figure 1 is the cover of teaching materials used in social studies learning with discovery learning model. On the front page displays the title of the material and the name of the author. An example of the content of interactive digital teaching materials can be seen in Figure 2.



Picture 2. Sample content of interactive digital teaching materials

Figure 2 is the content of interactive digital teaching materials used in social studies learning with discovery learning model. Not only displays the material in the form of writing, but teaching materials also display experimental videos so that they can provide a more real experience to them in accordance with the learning model used, namely discovery learning. Data on student learning outcomes in experimental and control classes obtained from posttest scores are presented in Table 1. This posttest value data is then tested for normality and homogeneity of the data.

Chart 1. Posttest Data on student learning outcomes

Parameters	Control Class	Experimental Class
Number of students (N)	24	25
Average value (X)	59,4	72,8
Standard deviation (sd)	11,732	5,605

Based on Table 1, it is known that the average value of the experimental class is 72.8 while the control class is 59.4. This shows that the initial learning ability of the experimental class is good while the learning outcomes of the control class is sufficient. Normality test results posttest data shown in Table 2.

Chart 2. Posttest data normality test results

Class	D <sub>hitung</sub>	D <sub>table</sub>	Conclusion
experiments	0,187	0,272	Normal
Control	0,163	0,278	Normal

Based on Table 2 it is known that the experimental class learning outcomes  $D_{hitung}(0.187) < D_{table} (0.272)$ . As for the control Class obtained  $D_{hitung} (0.163) < D_{table} (0.278)$ . Based on the normality test results showed that  $H_0$  is accepted, then the data learning outcomes of both classes are distributed normally.

Chart 3. Homogeneity test results posttest data

Class	F <sub>hitung</sub>	F <sub>table</sub>	Conclusion
Experiments, Control	0,228	2,01	Homogeneous

Based on Table 3 obtained learning outcomes for experimental class and control class  $F_{hitung} (0.228) < F_{table} (2.01)$ , then the experimental class learning outcomes data and control class is homogeneous. Furthermore, the similarity test of two averages with two-party t-test using independent sample t-test. The results of the t-test (posttest) are presented in Table 4.

Table 4. T-test results

Indicator	Experiments	Control
Number of samples	25	24
Mean	72,8	59,37
Varians	31,42	137,64
t <sub>hitung</sub>	5,14	
t <sub>table</sub>	2,01	

Table 4 shows that  $t_{hitung} > t_{table}$ ,  $(5,14) > (2,01)$ , then the research hypothesis is accepted that the use of interactive digital teaching materials in social studies learning with discovery learning model has a positive effect on student learning outcomes grade VIII SMPN Nilau Tapan. Interactive digital teaching materials can help in the learning process, can be used independently by students, and can explain phenomena that cannot be visualized. In line with Muhson's statement (2010) that learning media can concretize abstract concepts, so as to reduce verbalism. Furthermore, according to Viajayani, Radiyono, and Rahardjo (2013) computers can make abstract concepts concrete with stasis visualization or with dynamic visualization (animation), besides that computers can make a concept more interesting so that it adds motivation to learn and understand it.

The learning process using interactive digital teaching materials makes students more interested in participating in learning. The learning process becomes more effective and efficient. Some researchers stated that interactive digital teaching materials facilitate teachers in delivering material that is abstract and cannot be observed directly (Anwariningsih & Ernawati, 2013; Chien, Chen, & Jeng, 2010; Leow, 2014). Interactive digital teaching materials can visualize material that cannot be observed directly such as the course of light so as to make the image come alive. With the Learning media will be clearer meaning so that it can be better understood by students and allows mastering and achieving learning objectives (Anjarwati et al., 2016; Lin & Wu, 2016; Sudjana & Rivai, 2011). With learning media, the material learned will be clearer and easier for students to understand, and allow students to master good learning goals (Djamarah & Zain, 2002).

The results of data analysis showed that the use of interactive digital teaching materials had a positive effect on the learning outcomes of grade VIII SMPN Nilau Tapan. The learning outcomes of students who learn with the help of interactive digital teaching materials are higher than those of students who learn without the help of interactive digital teaching

materials. The results of Kurniawan's research (2016) show that learning with instructional media produces better learning outcomes, because with the use of instructional media students are more active in asking and discussing the material being studied. This is reinforced by Gustina, Abu, and Hamsyah (2016) who stated that multimedia-based learning media affect students ' cognitive learning outcomes because multimedia-based learning media can present the material as a whole and systematically so that it is easier for students to understand and enable students to master better learning objectives.

Learning with the help of multimedia is more effective in improving learning outcomes (Gunawan et al., 2015) . The application and use of interactive digital teaching materials greatly supports learning that will improve student learning outcomes, because these teaching materials can visualize the material clearly through images, videos, and animations, are attractively designed, and can interact with students. The use of instructional media can change students ' thinking about abstract material to be more concrete. For example, students can observe the process of light travel in mirrors and lenses. Thus students can improve their ability to understand the material presented. In accordance with the results of research Sukiyasa and Sukoco (2013) which shows that the learning process by using instructional media can provide ease of understanding of students, so as to improve the achievement of student learning outcomes. Some researchers also emphasize that the use of instructional media effectively improve student learning outcomes (Gustina et al., 2016; Izzudin et al., 2013; Ramadhani et al., 2016; Viajayani et al., 2013). Through the use of learning media students do more learning activities such as interacting with the media and other activities so that students do not feel bored. This is reinforced by the application of discovery learning models in the student learning process. In accordance with the results of Biological Research, Bintari, and Sukaesih (2018), the use of guided-discovery models can improve science skills, especially in observing activities. Interactive digital teaching materials make students more active in making observations related to abstract things for them. In addition, discovery Learning increases the activity of asking and discussing related to the material learned. This is reinforced by the opinion of Wahjudi, (2015) that discovery learning will increase student activity in learning both individually and in groups. Kristin, (2016) also stated that discovery learning can build knowledge based on the initial knowledge possessed by students so that students can later have a deeper understanding. Discovery learning learning can improve student learning outcomes because learning is based on students so that students are active, not saturated in learning (Hayati et al., 2018); Wahjudi, 2015; Kristin, 2016).

## CONCLUSION

Based on the results of research that has been done it can be concluded that the use of interactive digital teaching materials in social studies learning with discovery learning model has a positive effect on student achievement grade VIII SMPN Nilau Tapan. Interactive digital teaching materials with discovery learning models can improve student achievement in social studies learning. Thus, the use of interactive digital teaching materials with discovery learning models can be used by teachers to accommodate students ' cognitive abilities so that student achievement can increase.

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