



The application of e-worksheet assisted by EPSON EB-695WI finger touch interactive projector to increase learning quality in classroom

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ABSTRACT

Science is one of the lessons which is still considered difficult. This assumption will be stronger if the learning is not attractive, the role of the teacher as a facilitator is not optimal, the teacher does not use instructional media, the teacher does not actively involve students in learning, many formulas but less practice, and the teacher does not optimally apply the learning model. The impact of the learning process becomes less effective, which results in learning goals not being reached to the maximum. The purpose of this study is to improve the quality of learning in the classroom by using e-worksheet assisted by learning media Epson EB695Wi Finger Touch Interactive Projector. This research was conducted in class of VIII-A Ar Raihan Junior Islamic High School of Bandar Lampung, Lampung, in March 2019, using the Classroom Action Research (CAR) method. Learning quality criteria in this study were seen from the activities and student learning outcomes. Data collection techniques used observation, tests, and questionnaires. The analysis uses descriptive analytical techniques. The results of this study indicate that the use of e-worksheet assisted with learning media Epson EB-695Wi Finger Touch Interactive Projector on static fluid material can increase student learning activities from an average of 52.57% in cycle I to 73.14% in cycle III, and learning outcomes from an average of 55.60 in the first cycle to 77.41 in the third cycle. So that in learning the teacher should always innovate to be able to motivate student interest in learning and improve learning activities with varied learning models and appropriate learning media, so that the quality of learning becomes optimal.

1. Introduction

Education has a vital role in the advancement of technology; the more advanced education the more advanced technology can be ascertained. One that plays a major role in the field of technology is science, science that is increasingly developing has given birth to various advanced technologies such as faster internet networks, increasingly efficient agricultural tools, and others. Technology also makes it possible for education to further develop by the use of technology in education in the form of instructional media such as making worksheet into e-worksheet using Kvisoft Flipbook Maker and Epson EB695Wi Finger Touch Interactive Projector as interactive learning media.

One branch of science is Physics. Physics is a scientific discipline that uses numbers or mathematical calculations to study parts of nature, interactions and physical phenomena from nature (Kusminarto, 2011). Some students consider Physics is difficult because the learning is not interesting, the teacher does not play a role as a facilitator, the teacher does not use teaching aids or learning media, the teacher does not actively involve students in learning, many formulas, lack of practice, and others. Physics is still difficult for students to understand so emphasis is needed so that teachers make innovations to improve learning, with the use of instructional media, teaching materials, and learning models that are applied in the learning process in the classroom.

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These conditions indicate that the teacher is one of the dominant factors causing student learning difficulties. During this time, teachers dominate learning with lectures and do not actively involve students in learning. Teachers rarely use interactive and interesting learning media. As a result, students become passive and are not given the opportunity to think and find their own concepts. Learning is very boring and ineffective, and results in low learning outcomes.

In accordance with the 2013 curriculum, in every learning students are required to be active, creative, and innovative, to develop students' thinking abilities related to certain subjects according to the age and character of students. In developing students' mathematical abilities, learning must be an environment in which students are able to be actively involved in useful activities. Students must be active in learning, not just copy or follow examples without knowing their meaning (Effendi, 2012).

The learning model applied in the learning process must be in accordance with the needs and conditions of students in a school, in addition to adjusting the subjects taught to students. As with Physics subjects when taught in the lecture method it makes it difficult for students to understand when compared to being taught using scientific methods.

In addition to the learning models that are worthy of attention, they are teaching materials, teaching materials are the resources used by the teacher to convey teaching. Every teacher needs various tools to be used to help and support learning. Teaching materials play a large role in making knowledge accessible to students and can encourage students to engage with knowledge in different ways. Teaching material which is still a favorite used in the international world is in the form of Student worksheets (worksheet).

Worksheets are a kind of printed learning material that is prepared and often used by teachers to help students acquire knowledge, skills and values by providing useful responses about learning objectives and enabling students to engage in active learning (Kaymakci, 2012). Various countries have long used worksheet. Indonesia has been using worksheet for decades. In addition, Turkey in Turkish literature and Turkish education, if observed, worksheet can be considered a new term. Actually worksheet was used in education until 1990 but it was not called worksheet but was called an exercise notebook (in Turkish "temrin defterleri"), tests, drawings, and others. After the reorganization of educational policy in Turkey in 1990, scientists tended to explore and introduce contemporary educational technologies and materials to the public (Kaymakci, 2012).

Learning media bring and evoke joy and joy for students and renew their enthusiasm, helping to establish knowledge in the minds of students and to enliven learning (Arsyad, 2011). But even though the media occupy a very important position as a source of learning, the media cannot completely replace the teacher's role. That is, the media in learning without the teacher is impossible to improve the quality of learning. In this case, the teacher is in charge of providing guidance to students about what they have to learn and how students learn material from existing media.

Active learning is learning that must foster an atmosphere in such a way that students actively ask, question, and express ideas (Suprijono, 2010). Learning is an active process of students in building their knowledge. Active learning is a learning process that fosters learning dynamics for students. The author has done innovative science learning without the help of instructional media that can be directly practiced by students and the implementation of learning is still limited to the use of simple cooperative learning models and STAD models through pictures in books.

Based on reflection and evaluation, science learning that has been done by the author turns out to be less interesting if it is too often done and without the help of learning media and practice.

The author understands and realizes that the implementation of natural science learning is not only fixed with one particular learning model. Students will feel bored and bored with learning models, media, or teaching aids that do not vary, which then will make students less able to build students' thinking abilities.

The learning model used should be able to pay more attention so that students have the ability to formulate and prove experimental hypotheses and independent learning according to the teacher is still very low, other than that 75% students are not actively discussing or doing scientific approaches. While the analysis of learning models on students shows teaching materials are still a favorite used in the learning process, worksheets provide questions that are very helpful in learning, but students do not get worksheets that have practical activities.

The right learning model to overcome the above problems is Guided Inquiry. Inquiry-based science education is considered the latest trend in science education reform. Scientific inquiry generally refers to various ways in which scientists study nature (Ertikanto, Wahyudi & Viyanti, 2015; Liang & Richardson, 2009). More than a procedure or method, guided inquiry is the process of investigating how, why or what, and then understanding the findings produced (Bhattacharayya, Volk & Lumpee, 2009).

Presentation of worksheets based on guided inquiry learning models requires interactive learning forms and media, the worksheets are packaged in electronic form or e-worksheets, worksheets made using Kvisoft Flipbook Maker. Kvisoft Flipbook Maker is interactive multimedia software for making Portable Document Format (PDF) files into flash pages, each PDF page can be flipped like a real book. This software will convert PDF files such as online magazines, e-newspapers, online catalogs, digital books, and other publications to share online. Kvisoft is proven to be a good and suitable virtual flipbook so that learning materials become very easily understood effectively even to the critical thinking ability of students. That is because the operation is very easy, the elements of music and animation are considered very positive for students (Rasiman & Agnita 2014).

This E-worksheet is used interactively by using the Epson EB-695Wi Finger Touch Interactive Projector interactive learning media. The Epson EB-695Wi is an ultra-short-throw interactive projector that has dual pen and finger touch capabilities. High brightness up to 3,500 lumens with WXGA resolution provides an attractive user experience. This projector has an Ultra-short-throw that is designed to present scalable screen sizes up to 80 inches so it is easy to adjust the projection screen that is displayed. This type of projector is the standard learning media used by Ar Raihan Junior High School of Bandar Lampung as a substitute for white boards and markers since the beginning of the 2018/2019 Academic Year. With the use of this interactive media students are increasingly motivated in learning which will have an impact on student activities and learning outcomes that increase.

Some efforts to improve and increase the involvement or activeness of students in learning, namely: (1) recognize and help students who are less involved; (2) prepare students appropriately; and (3) tailoring teaching to the individual needs of students. Student activities in the learning process are one indicator of student activities for learning (Supinah, 2015). The activities are aimed at the learning process such as asking questions, submitting opinions, doing assignments, being able to answer the teacher's questions and being able to work together with other students, as well as responsibility for the assignments given.

Learning has a continuous process to achieve learning goals called learning activities. Learning activities that take place in the learning process will affect learning outcomes. Learning outcomes are often used as a reference in assessing learning achievement and are a reflection of students' abilities during the learning process, and are also one indicator of achieving learning objectives

(Widiyasari, 2017). As an alternative to answering these challenges, the authors have sought to create interesting learning using e-worksheet assisted with Epson EB695Wi Finger Touch Interactive Projector. Then, the authors took the initiative to conduct a study on "The use of e-worksheet assisted learning media Epson EB-695Wi Finger Touch Interactive Projector" on static fluid material.

Based on the background of the problem, the formulation of the problem in this study are: (1) Is using e-worksheet assisted with Epson EB-695Wi Finger Touch Interactive Projector learning media on static fluid material can increase student learning activities?; (2) Can using e-worksheet assisted by learning media of Epson EB-695Wi Finger Touch Interactive Projector on static fluid material improve student learning outcomes?

The objectives of this classroom action research are: (1) to increase student learning activities with e-worksheet assisted by Epson EB-695Wi Finger Touch Interactive Projector media on static fluid material; (2) improving student learning outcomes with e-worksheet assisted by Epson EB-695Wi Finger Touch Interactive Projector assisted media on static fluid material.

The action hypothesis raised in this study is that if the learning process with e-worksheet is assisted by the learning media of the Epson EB-695Wi Finger Touch Interactive Projector can be carried out in accordance with the provisions and also in accordance with student conditions, it will be able to increase student learning activities and outcomes in the material static fluid.

2. METHOD

Classroom action research using e-worksheet assisted by the Epson EB-695Wi Finger Touch Interactive Projector learning media was carried out in class VIII A of Ar Raihan Junior High School, Bandar Lampung, Lampung, with 25 students. The study was conducted in March 2019, starting from the preparation phase (making e-worksheets, preparing lesson plans, and compiling instruments) to the learning implementation phase on static fluid material, and the preparation of reporting stages. In this study, the writer was assisted by a colleague as an observer.

Data collection techniques using: (1) questionnaire (student responses in the implementation of learning); (2) observation (student activities during learning); and (3) tests (learning outcomes). The research data consisted of qualitative data (observations) during learning and quantitative data, namely the results of static fluid learning tests with data sources obtained directly from students during learning.

Data analysis in this study used descriptive analytical techniques. Qualitative data are described and transformed quantitatively by determining the percentage of each observation. Data analysis was performed on each data collected, both quantitative and qualitative data (Astuti, 2011).

Based on the type of data, the analysis techniques used are described, namely: (1) quantitative data such as the value of student learning outcomes can be analyzed in simple descriptive statistics, namely with the mean (mean) and percentage (%); (2) qualitative data, that is data in the form of sentence information that gives an overview of students' expressions of the level of understanding of a subject (cognitive), activity or student's attitude towards the use of e-worksheet assisted by the learning media of Epson EB-695Wi Finger Touch Interactive Projector (affective).

Quantitative data on learning outcomes are tabulated and the completeness is calculated in each cycle. The data is analyzed for the success of learning that is applied with an indicator of increasing student learning outcomes, both the affective aspects (student activeness) and cognitive aspects in the form of increased activity and learning outcomes between cycles and the percentage of students who have completed learning or scored > KKM

(Minimum completeness criteria), namely 75.

3. RESULTS AND DISCUSSION

Student activities in the learning process include seven indicators, namely (1) asking questions to the teacher, (2) answering questions from the teacher, (3) working on the worksheets provided, (4) working with classmates, (5) exchanging opinions between friends one group (6), concludes the results of the discussion, and (7) presents the results of the discussion.

Guided inquiry is a learning model that the teacher in the learning process provides students with examples of specific topics and guides students to understand the topic (Eggen & Kauchak, 2012). According to Kuhlthau (2010), guided inquiry helps students to practice in a team, develop competence in research, knowledge, motivation, reading comprehension, language development, writing skills, cooperative learning, and social skills. Amin (1987), states that the term guided inquiry learning is used if in discovery activities, the teacher provides guidance or instructions that are broad enough to students. A learning approach that encourages students to learn actively and the teacher encourages students to find concepts, principles for themselves (Wilcox, in Suprihatiningrum, 2013).

According to Carin (1993), guided inquiry teaching provides an opportunity to engage students to gain insight and develop their own concepts better. Learning with the guided discovery approach occurs where with the guidance of the teacher students will work more directed in achieving the goals set. Teacher guidance is the direction of work procedures carried out by students. Howe & Jones (1993), states that guided discovery is more than just hand skills because of experience, and teachers still take part as mentors. Through guided discussions and other methods, students are guided in reflecting on activities by comparing, looking for patterns, predicting, and making explanations. Indirect guidance, the teacher develops useful and interesting results. According to Ertikanto, Wahyudi & Viyanti (2015) guided inquiry is very important for the process of learning science at every level of education.

So guided inquiry learning is a discovery of learning that is very important in providing opportunities for students to find principles or concepts for themselves, where students get help in the form of guidance from the teacher to be more directed towards achieving learning objectives.

The most important things as a basis for designing a guided inquiry learning include: 1) determining the objectives to be learned by students, 2) choosing a method that is suitable for the discovery activity 3), determining data observation sheets for students, 4) preparing tools and materials in full, 5) determine carefully whether students will work individually or in groups consisting of 2-5 students, 6) try first activities that will be done by students (Carin, 1993).

Learning Media is based on the principle that the knowledge that exists in every human being is received or captured through the five senses. The more senses are used to receive something, the more and more clear the knowledge obtained. Props are intended to exert as many senses as possible on an object so as to facilitate perception.

Education expert Bruner said learning should begin by using real objects first. Therefore, when the process of learning mathematics takes place, the teacher should use models or tangible objects for certain topics that can help students' understanding (Guntoro, 2010). Thus, it is clear that learning media in learning science is very necessary.

Learning is basically an effort to direct students into the learning process, so that they can achieve learning goals as expected. The implication is that learning is a process that must be designed,

developed, and managed creatively and dynamically by applying various approaches to create an atmosphere and learning process that is conducive for students (Syafudin, 2014).

The learning process using learning media means maximizing the function of all five senses of students to increase the effectiveness of learning by seeing, hearing, practicing, and using their thoughts logically and really. Media in learning plays an important role as an effective tool E-worksheet is created using Kvisoft flipbook maker software. Kvisoft flipbook maker is software to make PDF (Portable Document Format) files into flash pages, each PDF page can be flip (back and forth) like a real book. This software will convert PDF files such as online magazines, e-newspapers, online catalogs, digital books, and other publications to share online. It is very easy to make a realistic flash of turning pages of a book without programming skills (Hidayatullah & Rakhmawati, 2016). With just 3 steps of importing PDF / images / FLV, adjusting style and publishing, users can convert PDF to digital-based flash publications with an intuitive user interface.

Kvisoft Flipbook Maker can add image files, pdf, swf, and video files in FLV and MP4 formats. While the output or output of this software can be in the form of HTML, EXE, ZIP, and APP. TI Flash output flips the book as an HTML format that allows it to upload to websites for online viewing. The stand-alone output is EXE for CD delivery. The package is a ZIP format for fast email. and the output in the form of APP can be used on I-Phone and Tablet, I-Pad. (Wijayanto, 2014)

This software can change the appearance of PDF files to be more interesting like a book. Not only that, Kvisoft Flipbook Maker can also make PDF files to be like a magazine, Digital Magazine, Flipbook, Company Catalog, Digital Catalog and others. Utilizing the software, the media display will be more varied, not only text, images, videos, and audio can also be inserted in this media so that the learning process will be more interesting (Sugianto, Abdullah, Elvyanti & Mulyadi, 2017). So, it can be concluded that Kvisoft Flipbook Maker is an electronic media that can display PDFs and photos into flash sheets back and forth. For the initial display of the software can be seen in Fig. 1.

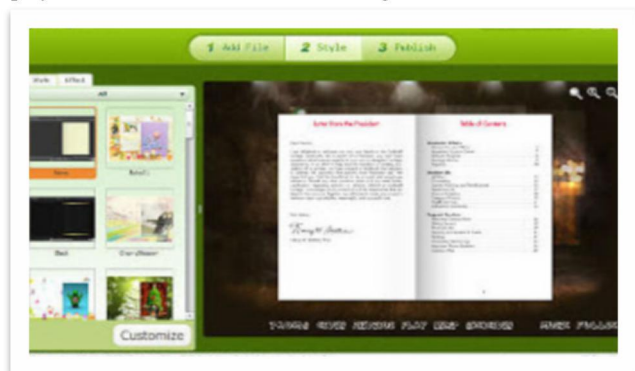


Fig. 1.

Display of Kvisoft Flipbook Maker (source: personal doc)

The benefits of e-worksheet assisted by the Epson EB-695Wi Finger touch interactive projector in learning is so that students can more easily use the worksheets made with Kvisoft flipbook maker that are already interactive. The use of interactive projector assistive media increasingly makes students enthusiastic about learning.



Fig. 2. Epson EB-695Wi (source: private document)

So that the implementation of learning runs well and the results can be maximized, learning improvement in the management of the learning process. Learning outcomes are things that can be viewed from two sides, namely students and teachers. From the student's side, learning outcomes are a better level of mental development when compared to before learning. The level of mental development is manifested in the cognitive, affective, and psychomotor domains. For teachers, learning outcomes are achievements when the completion of lesson material.

The analysis and discussion in this study is based on the stages for each ARC cycle. Each cycle would explain about improving aspects of learning activities and learning outcomes. The following is the description.

4. Cycle-I

The aspect of student activity in the learning process includes seven indicators, where the achievement of each indicator is in percentage. The first indicator in the learning process, namely asking questions to the teacher, the average percentage of the first meeting and the second meeting is 60%. Students are still unfamiliar with learning carried out using e-worksheet and Epson EB-695Wi learning media; who answered questions 32%; working on activity sheets in groups shows 64%; working with friends 1 group 84%; exchanging opinions between friends in a group of 64%; make conclusions 28%; and presented the results of the discussion and the results of the exercise 36%. So, the average student activity classically in the first cycle is 52.57%.

In the aspect of learning outcomes of 25 students who took the test, 10 students (40%) were declared complete and 15 students (60%) were declared incomplete in learning. Based on these results, there are several factors that influence, for example, less than the maximum teacher in guiding student learning, students are not accustomed to using e-worksheet in practicum, not enough time to discuss practice questions, so that the completion of learning is still less than 50% and the class average is only 55.60 still below the KKM of 75. Students who have not yet been completed are given independent remedial learning and exercises related to hydrostatic pressure, with the hope that the next meeting will be able to adjust to what has been completed.

The results of student questionnaire data analysis on the use of e-worksheet in the first cycle, which consisted of 8 indicators, showed that e-worksheet was interesting to learn. Learning activities with e-worksheet are fun. The use of e-worksheet facilitates understanding of the material being studied. E-worksheet stimulates curiosity about science. The Epson EB-695Wi-assisted E-worksheet is suitable for use as a learning medium on static fluids. Group learning using e-worksheet allows students to learn to give and receive ideas from other friends. E-worksheet is easy to learn as a group especially because all students have laptops.

Overall, e-worksheet is easy to understand so that there are 10 students (40%) who strongly agree to learn to build static fluids using e-worksheet, 10 students (40%) state that they agree to learn to build rectangles using e-worksheet, and 5 students (20%) expressed disagreement.

5. Cycle-II

Aspects of student activity in the learning process in cycle-II are achieved as a percentage. Each indicator has experienced an increase in the percentage of student activeness. The first indicator in the learning process, namely asking questions to the teacher, on average the percentage from the cycle-I of 60% to 72%, students have started to become familiar with learning that is carried out using e-worksheet which answers the first-cycle questions 32% to 40%. This situation is due to students engrossed in their laptops so they are less focused on the questions raised by the teacher.

Working on activity sheets in groups in the first cycle showed an increase from 64% to 68%. Students have begun to be seen in group activities, working together with friends from one group from 84% to 88%. Exchanging opinions between friends in groups increased from 64% to 72%, made conclusions from 28% to 40%, and presented the results of discussions and the results of exercises from 36% to 40%, so that the average classical activity of students in the first cycle was 52, 57% to 60% in cycle-II.

Learning results show that total of students who completed learning was 13 students (52%) while 12 students who did not complete (48%). Then the average value obtained from the second cycle has increased by 61.90. Although the average score has increased, the learning process that has been implemented is still not optimal, so there are still students who had not yet completed. For those who have not completed yet, they were given remedial individually and given assignments outside of class hours, with the hope of completing the material before proceeding to the next material.

The results of the questionnaire data analysis in the second cycle showed that there were 14 students (56%) who strongly agreed to study pascal legal material using e-worksheet, 9 students (36%) stated that they agreed to study pascal law using e-worksheet, and 2 students (8 %) expressed less agreement. From this analysis, there has been an increase in the number of students who respond to learning using e-worksheet. There are still students who disagree, because they do not concentrate on ongoing learning.

Student activities are activities or behaviors that occur during the learning process. The activities in question are activities that lead to learning such as asking questions, submitting opinions, doing assignments, being able to answer teacher's questions and being able to work together with other students, as well as being responsible for the assignments given (Amalina, 2018). Thus, student activities are seen in the learning process with guided inquiry models and using e-worksheets that have been designed and prepared.

6. Cycle-III

Aspects of student activities in the learning process in cycle-III shows that each indicator of the activities carried out has experienced a significant increase. The first indicator in the learning process, namely asking questions to the teacher, the average percentage increased to 80% from 72% in cycle-II. This is because students are getting used to learning carried out using Epson EB-695Wi-assisted e-worksheet. Students who answered the questions in cycle-II rose from 40% to 60% because the students had started to focus on learning so they focused on the questions asked by the teacher through e-worksheet, working on group activity sheets in cycle-68% to 80%, students have begun to be seen in group activity, working with friends from one group from 88% to 92%, exchanging opinions between friends in groups from 72% to 80%, making conclusions from 40% to 60%, and presenting the results of discussions and training results from 40% to 60%, so the average classical activity of students in the second cycle is 60% to 73.14% in the third cycle.

In aspect of learning outcomes, total of students who completed learning was 21 students (84%) while 4 students who did not complete (16%). Then the average value obtained from the third cycle has increased by 77.41. The increase in learning activities has an impact on learning outcomes that also increase, although there were still students who had not completed yet. For those who had not been passed, they were given remedial individually and given assignments outside of class hours, with the hope of completing the material before continuing the test.

Mastery learning is the key to successful learning. The percentage of completeness from cycle-I to cycle-II increased by 12%, although the completeness has not reached 75% and the average value in cycle-I has not yet reached the minimum completeness criteria (KKM) score of 75. But at the second-cycle, the average the average rises to 61.90 and in cycle-III reaches 77.41, an increase of 15.51 as shown in Table 1 below.

Table 1. Achievement of Each Cycle

Variable	Cycle I	Cycle II	Cycle III
Average			
Learning Activities (%)	52,57	60,00	73,14
Average	55,60	61,90	77,41
Learning Completion (%)	40,00	60,00	84,00

The table shows that learning using e-worksheets on fluid material is very interesting for students to learn, so that it can increase learning activities and is accompanied by an increase in learning outcomes as indicated by 84% completeness.

The results of the questionnaire data analysis in the third cycle showed that there were 15 students (60%) who strongly agreed to study pascal legal material using e-worksheet, 10 students (36%) stated that they agreed to study pascal law using e-worksheet, and no one stated disagree. From this analysis it can be seen that there is an increase in the number of students who respond to learning by using e-worksheet.

7. Conclusions

The results and discussion above show that the use of e-worksheet with the help of Epson EB-695Wi Finger Touch Interactive Projector can increase student activity in the learning process with indicators asking questions to the teacher, answering questions from the teacher, working on the given worksheet, working with friends one group, exchanging opinions between groups, making conclusions based on the results of the discussion, presenting the results of the discussion. While aspects of learning

outcomes show an increase in student learning outcomes from cycle to cycle, namely (1) an increase in activity from an average of 52.57% in the first cycle, to 60% in the second cycle and increased to 73.14% in cycle-III; (2) an increase in average student learning outcomes from 55.60 in the first cycle, to 61.90 in the second cycle and increased to 77.41 in the third cycle.

In addition to student activities and learning outcomes in the learning process using e-worksheet media assisted by Epson EB-695Wi Finger Touch Interactive Projector on static fluid material, the results of the questionnaire showed the percentage of students who agreed strongly 40% in cycle-I, 56% in cycle-II and rose to 60% in cycle-III, then those who agreed 40% in cycle-I, to 36% in cycle-II and increased again to 40% in cycle-III. In cycle III, none of the students answered disagreeing.

8. Suggestions

Based on the conclusion above, the suggestion that can be given is that the use of e-worksheet media assisted by Epson EB-695Wi Finger Touch Interactive Projector in science learning should be used as an alternative that is able to activate students in learning, which in turn increases student learning activities and outcomes. Thus, creative teachers should integrate models with learning media to create innovative, effective, and fun learning.

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