The Effect of the Blended Learning Model Based on the Nearpod Application on Students' Physics Interest and Learning Outcomes at MAN

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Abstract - This research aims to determine the effect of a blended learning model based on the application of Nearpod on students' interest and learning outcomes in physics at one of the secondary schools in Jember. This research is a type of experimental research that uses a post-test only control group design. The population of this study were students of class XI MIPA and XI BIC. Sampling used a random sampling technique, so that XI BIC 2 students were obtained as a control group implementing the conventional learning model and XI MIPA 1 as an experimental group implementing blended learning based on the Nearpod application. The instrument used is a physics student interest questionnaire which consists of 4 indicators and a posttest in the form of a multiple-choice test which refers to students' cognitive abilities to remember (C1), understand (C2), apply (C3), analyze (C4), evaluate (C5), and create (C6). Questionnaire data and post test data regarding the influence of blended learning based on the Nearpod application on students' interest in learning and physics learning outcomes will be tested for homogeneity. If a significance value >0.05 is obtained, questionnaire and post test data for the control class and experimental class were normally distributed. Interest data and physics learning outcomes were analyzed using parametric statistics, namely the Independent Sample T-test. Based on the hypothesis testing criteria, H0 is rejected (Ha is accepted) if the sig value is <0.05, meaning that there is an influence of the Nearpod application-based blended learning model on student physics interest. Meanwhile, in the physics learning outcome test, students got the sig value of <0.05, which means that Ha is accepted, meaning that there is an influence of the Nearpod-based blended learning model on student physics learning outcomes. The application of the blended learning model based on the Nearpod application has a significant effect on students' interest and learning outcomes in physics.

Keywords: Blended Learning; Nearpod; Learning Outcomes

INTRODUCTION

Education is a form of effort that is organized to create a learning environment so that students can be actively involved in developing their potential in order to obtain the strength of intelligence, personality, skills and self-control that they need in society (Rahman et al., 2022). Education is asked to always follow technological developments to support the learning process. The application of information technology is expected to change the learning orientation that focuses on teachers to focus on students. Students act as teaching subjects who actively develop their potential (Putriani & Hudaidah, 2021). Changes in technology-based learning systems into new innovations are relevant to the needs of the times. Technological developments make it easier for teachers to apply interactive media that can attract students' interest in learning (Munandar & Ahmad, 2022).

Based on observations from one of the schools in Jember, it is known that the institution is implementing the 2013 curriculum. The teacher's teaching approach still applies the lecture and discussion method. One Physics teacher stated that the learning process was less effective because of the need to repeat explanations of previous material related to new material. The lack of appeal in monotonous teaching

methods makes students lose interest in learning. Interest in learning is a form of individual interest in learning without coercion. Interest in learning can be measured through four indicators including learning participation, feelings of enjoyment, attention to learning, and interest in learning (Yolviansyah et al., 2021). Interest in learning influences the smoothness of the learning process in class. When students have a good interest in learning, they will pay extra attention to material that interests them. Meanwhile, students with low interest in learning will show their lack of enthusiasm for lessons. Students who are less interested in learning tend to distract or disturb their friends (Hutauruk & Erika). The low interest in studying physics among students is proven by students' incomplete learning outcomes. Learning outcomes are determined through consideration of cognitive, affective and psychomotor aspects (Nugraha et al., 2020). Learning physics not only requires students to memorize mathematical formulas, but also emphasizes students' ability to understand and relate physics concepts to one another. Evaluation of learning outcomes is more often focused on products through objective tests. Cognitive aspects are often the main focus in teacher assessment. Student cognitive learning outcomes are influenced by individual abilities, student interests, and other factors (Bahari et al., 2023).

Digitalization of education has the potential to overcome low student interest and learning outcomes. One solution that can be implemented to deal with this problem is by implementing a blended learning model using interactive learning applications (Nasrullah & Rahman, 2023). The choice of learning model is adjusted to student needs. There are several learning models that can support students' active involvement in learning, for example discovery learning models, problem-based learning models, project-based learning models, mixed learning models and so on. The author is interested in implementing a blended learning model, because blended learning is a learning approach that combines various teaching models, teaching methods and technological media. Blended learning is similar to combining face-to-face learning and online learning (Husamah, 2014).

Related research results by Jumaini (2023) revealed that the blended learning model had an effect on increasing students' understanding of learning concepts. At elementary school level, the average increase in conceptual understanding was 91%. At junior high school level, the average increase in understanding was 91%. At the high school level, the average increase in understanding is 90%. This increase is included in the category of having a very strong influence on the learning process. Zega (2022) stated that the influence of using the blended learning model on students' understanding of physics concepts was found. The form of technology implementation in blended learning can be found in the use of application-based learning media. One learning media that can be applied in learning activities is Nearpod.

Nearpod is an educational platform that enables teacher and student interaction both online and offline. Nearpod can make learning more interactive and provide responses to students (Pramesti et al., 2023). Nearpod can be used as a virtual space so that teachers can share materials, interactive games, assignments, and even interactive videos with students. The learning process with videos using the Nearpod application can connect the material with applications in life so it is hoped that it can increase student learning engagement (Perwithasari et al., 2023). The Nearpod application has 20

features that can be used according to your needs. Some of the Nearpod features include virtual field trips, time to climb, open ended questions, draw it, and so on (Inanta et al., 2022).

Learning physics using Phet on Nearpod can improve high-level thinking skills and student learning outcomes because students are encouraged to be able to solve problems independently as researched by (Ulumiyah et al., 2021). Research results (Perlawanan et al., 2022) state that the Nearpod application can help students to improve learning outcomes so that it is suitable for application in learning.

Based on the description of the lack of innovation in teaching, low interest in learning physics, low physics learning outcomes and the efficiency of using interactive applications in learning, the author is encouraged to carry out research that combines learning models and interactive applications. The research that will be designed is regarding "The Effect of the Blended Learning Model Based on the Nearpod Application on Students' Physics Interests and Learning Outcomes at MAN (State Islamic High School)".

RESEARCH METHODS

The type of research used is experimental research. The research design applied was a true experimental design with a posttest only control design model. The population of this research is class XI MIPA (11th graders majoring math and science) students for the 2023/2024 academic year. In this study, the research sample consisted of two classes, namely the experimental class and the control class. The selection of classes as research samples was determined through a homogeneity test of physics final grades by the teacher. If it is homogeneous, then random sampling will be conducted. However, if it is not homogeneous then it is

determined using the average that has the smallest difference between each sample. Data was obtained through questionnaires, posttests, interviews and observations.

Students' learning interest is measured using a questionnaire containing several indicators of learning interest. The student interest in learning questionnaire will be assessed based on a Likert scale. Data resulting from learning interest will be analyzed using normality tests and hypothesis tests. If the data is not normal it will be tested using the Mann-Whiteney U test. If the data has a Sig value of ≥ 0.05 then the data is classified as being normally distributed. If the data has a Sig value of <0.05 then the data is not normally distributed. Then the researcher will continue with hypothesis testing. The statistical hypothesis consists of H0 : $\mu 1 = \mu 2$ and Ha : $\mu 1 \neq \mu 2$. H0 is accepted (Ha is rejected) if sig. the value is ≥ 0.05. H0 is rejected (Ha is accepted) if the sig value is <0.05.

RESULTS AND DISCUSSION
Result

This research is included in the experimental research category which applies a post-test only control group design. This research was carried out at Madrasah Aliyah Negeri (State Islamic High School) in Jember from 13 November to 22 November 2023. This research was carried out according to research procedures, including the preparation stage by preparing a proposal and research instruments. Next is to determine the research population and sample. The research population includes class XI MIPA 1, XI MIPA 2, XI MIPA 3, XI MIPA 4, and XI BIC, while the research sample included two classes, namely the control class and the experimental class which were determined through a homogeneity test based on previous physics

learning results. The homogeneity test was carried out with the help of SPSS Statistics 25 as in Table 1.

Table 1. Homogeneity test

		Levene Statistic	df1	df2	Sig.
Physics Learning Outcome	Based on Mean	1.310	5	184	.262
	Based on Median	.935	5	184	.460
	Based on Median and with adjusted df	.935	5	167.355	.460
	Based on trimmed mean	1.289	5	184	.270

Based on the results of the homogeneity test, it was found that the results of previous physics learning material were homogeneous, as shown in Table 1, so the sampling technique applied was random sampling. Class XI MIPA 1 was designated as the experimental class and Class XI BIC 2 was designated as the control class. Teaching and learning activities in the experimental class apply blended learning model based on the Nearpod application. Meanwhile, learning in the control class is carried out using a problem-based learning model implemented by physics teachers at school.
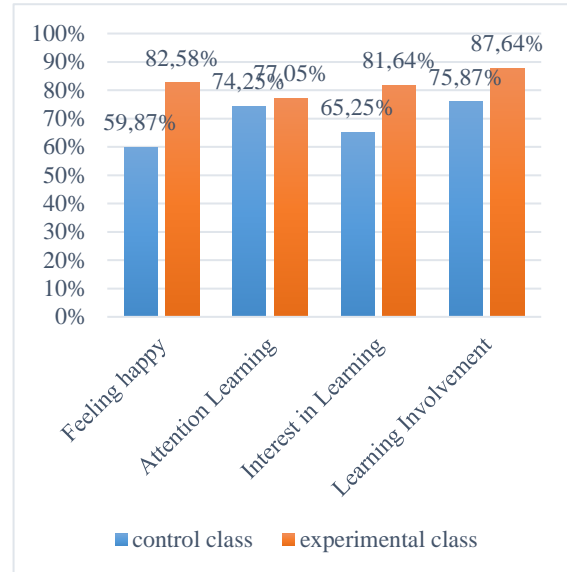
Figure 1. Indicators of Interest in Learning Physics

The experimental class obtained the highest percentage on the learning engagement indicator and the lowest percentage on the learning attention indicator as shown in Figure 1 due to student behavior that the teacher cannot fully control. This has an impact on students' less than optimal attention to learning.

Table 2. Independent Sample T-Test Interest in Learning Physics

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
Physics Learning Interest	Equal variances assumed	.347	.558	-8.005	64	.000	-13.235	1.653	-16.538	-9.932
	Equal variances not assumed			-7.978	62.178	.000	-13.235	1.659	-16.551	-9.919

Based on the output showed in Table 2, the sig value is obtained. (2-tailed) 0.000 can be interpreted as a smaller value than the significance level of 0.05. On the basis of decision making, it was decided that H0 was rejected (Ha was accepted), so that there was a significant influence of the blended learning model based on the Nearpod application on interest in learning physics.

Table 3. Independent Sample T-Test Physics Learning Results

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
Physics Learning Outcome	Equal variances assumed	5.419	.023	-11.097	64	.000	-28.989	2.612	-34.208	-23.770
	Equal variances not assumed			-10.952	51.863	.000	-28.989	2.647	-34.301	-23.677

Based on the output produced in Table 3 the sig value is obtained. (2-tailed) 0.000 can be interpreted as a value smaller than the significance level of 0.05. Based on the basis of decision making, it can be decided that H0 is rejected (Ha is accepted). Thus, there is a significant influence of the blended learning model based on the Nearpod application on physics learning outcomes.

Discussion

Students' interest in learning physics in the good category is supported by the learning model and media applied. Students' feelings of joy are supported by the use of the Nearpod application which is new for students as well as interactive features that create an interesting learning atmosphere. Students' interest in learning is triggered by static fluid material that is relevant to real life and a flexible learning process. Students' attention to learning can increase because of their comfort in online and offline learning so that students are not trapped in a monotonous learning approach. Student learning engagement can increase due to the collaboration and mutual training phase which allows them to exchange knowledge.

The implementation of blended learning with Nearpod is a new innovation that makes it easier for teachers and students to interact even outside class hours. Nearpod media presents interesting animations and stimulates curiosity (Oktafiani, 2022). The blended learning model emphasizes the role of students during the learning process so that it will make it easier for students to learn anywhere and anytime. The blended learning model based on the Nearpod application is able to create a pleasant learning atmosphere because students can choose the learning activities they want. Muliani & Arusman's (2022) research concluded that interest in learning creates

interest without any compulsion in participating in the learning process.

Interest in learning has an impact on student learning outcomes. When learning is not accompanied by interest, students become lazy and dissatisfied with the learning process. If the learning experience in class is considered less interesting and less enjoyable, students may not be motivated to study at home. Increasing student interest in learning can contribute positively to student learning outcomes and create a more positive environment (Ummah & Fiqry).

Interest in learning has an important role in achieving learning goals. The blended learning model is able to increase students' interest in learning physics (Puspitarini, 2022). Korompot et al., (2020) stated that formal education institutions can take various approaches to explore and increase student interest, such as paying attention to teachers' teaching styles and the use of learning media. Through this research, it can be seen that students' interest in learning physics can be encouraged through the application of a blended learning model based on the Nearpod application

Student cognitive learning outcomes were obtained through post-tests in the control class and experimental class. The average physics learning outcomes for the experimental class are higher than the average physics learning outcomes for the control class. The average learning outcome for the control class was 52. Meanwhile the average learning outcome for the experimental class was 81. The physics learning outcome for the control class was very poor. Meanwhile, the experimental class physics learning results are included within the good category. This is caused by several factors, including students' actively solving problems during learning activities, and the interactive Nearpod application's making students interested and wanting to

know more during learning. Apart from that, the blended learning model, which has never been implemented at MAN 1 Jember, increases students' interest in independent learning.

Data on physics learning outcomes were normally distributed so that an Independent Sample T-Test was tested and the results in Table 3 showed that there was a significant influence of the blended learning model based on the Nearpod application on students' physics learning outcomes. Physics learning activities that apply a blended learning model based on the Nearpod application can provide a fun learning experience that can help hone students' low- and high-level thinking skills. This is because students have participated in several blended learning phases during the learning process. In the prepare me and tell me phase, students can relate new information to the knowledge they already have, which is equivalent to the ability to remember (C1). In show me phase, students are invited to apply their understanding in simulation activities that are the same as understanding skills (C2). In let me phase, students develop understanding through simulation activities and analyzing simulation results which is similar to the ability to apply (C3) and analyze (C4). In the check me phase, students can assess errors in their work and correct them, which is similar to the ability to evaluate (C5). In the connect me phase, students collaborate in solving the problems given, allowing them to create new understandings related to static fluids which is equivalent to the ability to create (C6). Students who actively take part in class and collaborate with each other can explore the learning material more deeply.

Students' skills in thinking at a higher level can be trained by selecting appropriate learning strategies (Khoiriyah et al., 2023). The development of students' high-level

thinking skills with blended learning can be seen in collaboration and evaluation activities that involve critical thinking, in-depth analysis, and integrating knowledge from various sources. The blended learning model has a positive impact on students' understanding of physics concepts (Zega et al., 2022). The application of the mixed learning model is more effective in honing students' concept understanding because students are directly involved, thereby encouraging students' activity and learning outcomes (Jumaini et al., 2023).

During the research process, there was an obstacle experienced by the researcher, namely that in the experimental class, not all students brought laptops, which hampered the learning process. The solution taken by the researchers was to encourage students to bring laptops to the next meeting and use cellphones to access the Nearpod application, even though it was a little slow. The second obstacle is difficulty in connecting the projector to the laptop and the red projector display. The solution the researchers took was to change laptops and try reconnecting. Researchers were unable to carry out the evaluation phase because of the lost learning time due to the obstacles that have been described. Thus, in the second experimental class the researcher prepared all learning devices and media in advance to minimize obstacles and loss of learning time.

The use of the Nearpod application makes it easier for students to deepen the material, search for information, and increase their enthusiasm for learning. It is hoped that the Nearpod application can become an alternative media for teachers to overcome problems in learning and help improve students' physics learning outcomes. Apart from that, it is hoped that the implementation of blended learning with the help of the Nearpod application can overcome the problem of lack of innovation in learning media so that the learning process can be carried out both online and offline.

CONCLUSION

Based on the results of the research and discussion, it can be concluded that the blended learning model based on the Nearpod application has a significant effect on students' interest in studying physics at MAN for static fluid material. The blended learning model based on the Nearpod application has a significant effect on student physics learning outcomes at MAN for static fluid material.

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