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THE EFFECT OF NEARPOD INTERACTIVE MEDIA IN THE DISCOVERY LEARNING MODEL ON THE LEARNING OUTCOMES OF CLASS XI MIA MAN 4 BONE STUDENTS (STUDY ON ACID-BASE SUBJECT MATTER)

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Abstract

The purpose of this study was to determine the effect of Nearpod interactive media on discovering a learning model on learning outcomes of class XI MIA students of MAN 4 Bone. The research method used was a quasi-experimental with a quantitative approach and using a posttest only control group design. The research population were all from class XI MIA with a total of 2 classes. The research samples were class XI MIA 1 as the experimental class and class XI MIA 2 as the control class. The data collection technique used multiple choice tests to obtain data of learning outcomes. Data analysis was conducted using descriptive and inferential statistics. The results of statistical analysis showed that the experimental class' average learning outcomes were 75.53, higher than the control class, which was 71.28. The results of statistical analysis of learning outcomes showed that the experimental and control class data came from a homogeneous population but not normally distributed, so that the test used was the Mann-Whitney test. From data analysis, it showed $Z_{count} (3.88) > Z_{table} (1.64)$. Based on data analysis, it could be concluded that there was an effect of Nearpod interactive media on the discovery learning model on learning outcomes of XI MIA Students of MAN 4 Bone on acid base subject matter.

Keyword: Nearpod interactive media, discovery learning model, learning outcomes

INTRODUCTION

The application of learning media as a message should be in line with the development of the 4.0 era needed to have new and quality innovations with the characteristics of students who like gadgets that should be accommodated by educators [1]. The Discovery Learning model, as one of the recommended models on the K13, has been implemented in schools, including in MAN 4 Bone. However, the use of the Discovery Learning model in MAN 4 Bone has not been optimal because the use of media as a support for learning is less interactive with students. The use of powerpoints in delivering teaching materials still dominates learning, so this will have an impact on low student learning outcomes. Technology of the internet is bridged by digital media. One example is Nearpod interactive media.

Nearpod is an enhanced learning medium that makes it possible to create interactive presentations with quizzes, polls, drawing

activities, filling in blanks, memory tests, and collaboration boards [2]. The use of Nearpod media in this chemistry subject, especially acid-base materials, is expected to make students more active, so it can improve student learning outcomes. The use of learning media in schools will be more effective if we collaborated with the right learning model and we recommend learning using the 2013 curriculum. The Discovery Learning model is a model to develop a way of learning active students by finding themselves, exploring themselves, then the results obtained will be faithful and long-lasting in memory, and will not be easily forgotten [3]. Nearpod is suitable to collaborate with nearpod because with the use of media in the form of E-media Nearpod can make students better understand with various features in the form of video links, teaching materials displayed in the form of files that can be downloaded on laptops and cellphones. Likewise, it can be integrated with the website and evaluation questions are done online [4].

The discovery learning model is a teaching model that organizes teaching in such a way that learner acquires knowledge that they previously didn't know that was not through notification, partially or completely discovered by themselves [5]. One of the disadvantages of the discovery learning model is long-time learning. Educators should help learners discover theories or problem solving, and bring all learners' opinions together. One of the features that can be used in the Nearpod application to reduce the weaknesses of the discovery learning model is the collaboration board feature. Collaboration boards can be used in problem formulation syntax. With collaboration boards, student opinions can be raised on the screen so that will help to manifest learning time. Educators do not have to listen to all the opinions of students one by one. The application of the Discovery Learning model makes students understand basic concepts and ideas better and students transfer their knowledge to various contexts [3].

The application of the Discovery Learning model directs students more actively to acquire knowledge so that the subject matter will settle in students' thinking, the knowledge gained is meaningful, makes students understand basic concepts and ideas better and has a better transfer effect than other learning outcomes [6]. The acid-base material is suitable for collaboration with the discovery learning model based on research conducted by Setiadi (2019) that the discovery learning-based acid-base E-Module for class XI MA/MA produced has very high validity and practicality [7]. The e-module can be created using Nearpod mediabackground of the problem that has been presented above became the basis for the researcher to conduct a study on whether the Influence of Nearpod Interactive Media in the Discovery Learning Model on the Learning Outcomes of Class XI Man 4 Bone Learners on the Acid-Base Subject Matter?.

METHOD

This study is a quasi-experimental study that aims to determine the influence of Nearpod

interactive media based on the discovery learning model on the learning outcomes of class XI MIA MAN 4 Bone students on the acid-based subject. The research design used is The Posttest Only Control Design. Students will be given a posttest to find out the learning outcomes of the students. the post test only control design group scheme can be shown in table 1. as follows:

Table 1. Scheme PosttestOnly Control Design

Group	Intervention	Posttest
Eksperimen	→ X	→ O
Control	→	→ O

[8]

Research variables consist of two, namely independent variables and dependent variables. The independent variables are the Nearpod interactive media using the Discovery Learning Model and Discovery Learning Model without the Nearpod interactive media quiz. The dependent variable is the learning outcomes of Class XI MIA MAN 4 Bone Learners on the subject of acid-base.

The population in this study is all students of class XI MIA MAN 4 Bone for the 2021/2022 academic year, which consists of two classes. All of class XI MIA MAN 4 Bone have the same level of ability (homogeneous). Sample selection was carried out with a silent log system from both selected classes of class XI MIA 1 as the experimental class and class XI MIA 2 as the control class. This learning activity was carried out in the evening semester of the 2021/2022 academic year at MAN 4 Bone, South Sulawesi Province.

The instrument used in this study is a chemistry learning outcomes test aimed at measuring the cognitive aspects of students after following the learning process. Data collection of learning outcomes was carried out by giving a final test (posttest) to the experimental group and control group. Students are given multiple choice questions consisting of 25 items with five answer choices. Each correct answer is given a score of 1 and the wrong answer is given a score of 0. The test results from these two groups were then compared to find out whether there was an influence of

Nearpod interactive media using the Discovery Learning Model on student learning outcomes on acid-based materials.

RESULT AND DISCUSSION

This research was conducted using the nearpod interactive media in the discovery learning model on acid-base materials. The syntax of the discovery learning model is that using nearpod interactive media is the stimulus syntax, and the problem identification syntax. as seen in the picture. 1 following.

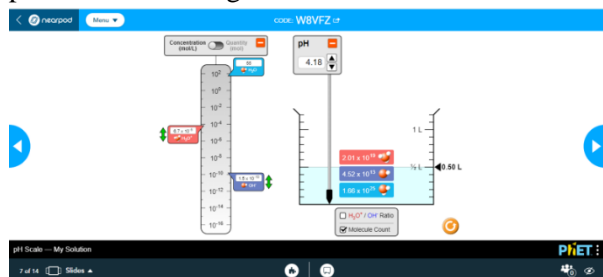


Figure.1 PhEt simulation features on stimulus syntax

Figure 1 shows that at the stimulus stage, nearpod interactive media is used with PhEt simulation features in the form of examples of acid and alkaline pH calculations. In the PhEt simulation, it can give students an idea that the higher the concentration value of a solution, the lower the pH and the stronger the acidity. With the use of the PhEt simulation, students will more easily understand the concept of acid-base. Meanwhile, in the problem identification syntax, the collaboration board feature is used by students to ask questions related to the stimulus that has been given previously. With this collaboration board feature, all students can ask questions via their own mobile phones as shown in the picture. 2 following.

The nearpod media used in this study was not only used in the syntax of the discovery learning model, but was also used at the learning evaluation stage. The features used at the learning evaluation stage are multiple choice, polling, and open-ended questions such as pictures. 3 following.

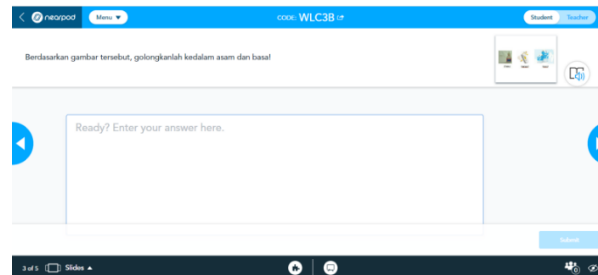


Figure 3. Features of open ended questions at the stage of providing learning evaluation

Descriptive statistical analysis was used to describe or provide a general description of the characteristics of the achievement of chemical learning outcomes in MAN 4 Bone for the subject matter of acids and bases in the experimental group and the control group. Based on the results of descriptive statistical analysis of the learning outcomes of class XI MIA 1 as an experimental group that was taught with Nearpod interactive media using the Discovery Learning model, teaching class XI MIA 2 as a control group that was taught using the Discovery Learning Model without Nearpod interactive media teaching the data obtained from the participants' learning outcomes teach according to Table 2.

Table 2. Description of Student Learning Outcomes in the Experimental Group and Control Group

NO	Descriptive statistics	Statistical Value (Posttest)	
		Experiment	Control
1.	Sample size	30	33
2.	Highest value	92	84
3.	Lowest value	28	28
4.	Average value	75,53	71,28
5.	Median	78,1	72,78
6.	Mode	86,61	73,15
7.	Standar deviation	13,77	13,31

The value obtained by students in the experimental group and the control group based on the standard of completeness of chemistry learning outcomes for class XI MIA MAN 4 Bone can be seen in Table 3.

Tabel 3. Percentage of Complete Learning Outcomes of Students

Value	Criteria	Experiment		Control	
		F	%	F	%
≥ 75	Complete	20	73,33	20	60,61
< 75	Not Complete	10	33,33	113	39,39
Total		30	100	333	100

Table 2 shows that the learning outcomes achieved by students in the experimental group who were taught using the Nearpod interactive media in the Discovery Learning Model were higher than the learning outcomes of students in the control group who were taught using the Discovery Learning Model without the Nearpod interactive media.

Inferential statistical analysis was used to test the research hypothesis, namely the effect of the Nearpod interactive media quiz in the Discovery Learning Model on student learning outcomes. However, before testing the hypothesis, a prerequisite test is carried out, namely the normality test and homogeneity test. Both of these tests are assumptions in hypothesis testing.

a. Prerequisite Test

1). Normality test

Based on the results of calculations, the experimental group obtained $X^2_{count} = 13.51$ and the control group obtained $X^2_{count} = 19.02$. The value at the significance level ($\alpha = 0.05$) and the degrees of freedom ($dk = 3$) obtained the value of $X^2_{table} = 7.81$. From the results of this calculation, we can see that in the experimental group and control group, each class obtained a value of $X^2_{count} > X^2_{table}$. It can be concluded that the samples in the experimental group and control

group were not normally distributed. In detail can be seen in Table 4.

Table. 4 Results of the Normality Test of Student Learning Outcomes in the Experimental Group and the Control Group

Class	X^2_{count}	$X^2_{table} (\alpha) = 0,05$	Conclusion
Experiment	13,51	7,81	Not Normal Distributed
Control	19,02	7,81	Not Normal Distributed

2). Homogeneity Test

Based on the results of the calculation of the homogeneity test, the value of $F_{count} = 1.09$ and the value of F_{table} at a significant level of 0.05 was 1.82. The value of $F_{count} (1.09) < F_{table} (1.76)$, so it can be concluded that the two groups, namely the experimental group and the control group, came from homogeneous variance. The results of the homogeneity test of the experimental group and the experimental group students' learning outcomes can be seen in Table 5.

Table 5. Results of Homogeneity of Learning Outcomes of Students in Experiment Group and Control Group

Class	F_{Count}	$F_{table} (\alpha) = 0,05$	Conclusion
Experiment	1,09	1,82	Homogeneous
Control			

b. Hypothesis testing

Hypothesis testing was conducted to determine whether there was an effect of Nearpod interactive media in the Discovery Learning Model on student learning outcomes. Hypothesis testing in this study was carried out by one-party statistical test with the formulation of the hypothesis as follows:

$$H_0: Z_{count} \leq Z_{table}$$

$$H_1: Z_{count} > Z_{table}$$

After conducting prerequisite tests (normality test and homogeneity test), it was found that the normality of the experimental group and control group came from populations that were not normally distributed. And both groups come from homogeneous variance, so hypothesis testing cannot be done using parametric statistical tests (t-test), but hypothesis testing can be done using non-parametric statistical tests, namely the Mann-Whitney test. Based on the calculation of student learning outcomes using the Mann-Whitney test, it was obtained that $Z_{\text{count}} = 3.88$ and the value of Z_{table} at a significance level of 0.05 was 1.64. This shows that H_0 was rejected and H_1 is accepted. So it can be concluded that there is an effect of Nearpod interactive media in the Discovery Learning Model on student learning outcomes.

Table 6. Hypothesis Test Results of Student Learning Outcomes

Class	Total	Z_{count}	$Z_{\text{table}} (\alpha) = 0,05$	Conclusion
Experiment	30	3,88	1,64	H_0 rejected
Control	33			

This research was conducted with the aim of discovering whether there is an effect of Nearpod interactive media in the Discovery Learning model on the learning outcomes of students in class XI MIA MAN 4 Bone on the subject of acids and bases. The use of Nearpod as a learning medium can help create a learning atmosphere so that it is not monotonous. The use of Nearpod interactive media makes students active and interactive in the learning process because it uses technology that is in accordance with the times. In the research, the features used are PhET simulations, videos, collaboration boards, and quizzes.

This study compared the learning outcomes of students using Nearpod interactive media in the experimental group with students without using Nearpod interactive media in the control class. However, the two groups were both taught with the Discovery Learning model on the subject of acids and bases. The increase in student learning

outcomes in the experimental group was due to the use of Nearpod interactive media in the stimulus stage, problem identification, and learning evaluation, which made students more active. At the stimulus stage, students pay more attention to the stimulus given because the stimulus can be seen, heard and moved directly by the students themselves. The simulation given is in the form of an acid-based practicum simulation that can be driven directly by the students themselves using their respective cell phones. Likewise, the videos provided can be seen and listened to directly using their own cell phones so that students can focus more on paying attention to the given stimulus.

At the problem stage, the feature used in the Nearpod interactive media is a collaboration board as shown in figure .2. The use of this collaboration board feature can make students more active because all students can ask questions using their respective cell phones so that students will not hesitate or be embarrassed about asking. In addition, the use of this collaboration board feature at the problem identification stage in the discovery learning model makes learning more efficient. The time spent is faster because the collaboration board collects all the questions on the displayed screen, thereby minimizing the weaknesses of the discovery learning model. This is based on Darmadi's opinion (2017), saying that the discovery of a learning model takes a long time to help students find theories or solve problems[9].

Features used in the evaluation stage are multiple-choice, open-ended questions, and polls. Multiple-choice is used at the time of the posttest, open-ended questions are used at the end of the evaluation at the end of the lesson and polls are used in the evaluation at the end of the lesson to assess the learning that has been done that day. The use of these features can improve student learning outcomes because students tend to be more interactive in learning. According to Susanto (2021), the advantages of Nearpod E-media include flexibility because it can be accessed anywhere as long as it has an internet network, allows interactive learning to occur, can be operated on cellphones or PCs and can be used

independently by students and its use is not limited to space and time [4].

The truth of the hypothesis is proven through hypothesis testing. Before testing the hypothesis, the prerequisite tests are first tested for normality and homogeneity. Based on the prerequisite analysis test, it was stated that the data from the experimental group and the control group came from populations that were not normally distributed and both groups came from homogeneous variance. Therefore, hypothesis testing was carried out using nonparametric statistical tests (Mann-Whitney test). The results of testing the learning outcomes hypothesis obtained the value of $Z_{count} > Z_{table}$, which means the proposed hypothesis is accepted. So, it can be concluded that there is an effect of Nearpod interactive media in the discovery learning model on the learning outcomes of students in class XI MIA MAN 4 Bone. The results of hypothesis testing can be seen in Table 4.7. The value of $Z_{count} > Z_{table}$ ($4.62 > 1.64$) indicates that there is an effect of Nearpod interactive media in the discovery learning model on the learning outcomes of students in class XI MIA MAN 4 Bone on acid-base materials. The nearpod feature that most supports acid-base material using the discovery learning model is the simulation feature with the collaboration board feature, with this feature students are more active in learning so as to improve student learning outcomes.

Results Based on data analysis, both descriptive statistical analysis and inferential analysis showed that the learning outcomes obtained with the Nearpod interactive media on the Discovery Learning Model were higher than students who were taught only using the Discovery Learning Model. The application of the discovery learning model in collaboration with nearpod interactive media is very suitable because it can streamline time and make students more active so that student learning outcomes increase. The results obtained are in accordance with Stacy's research. (2014) explained that the Nearpod application is highly recommended to teachers because this application is easy to use [10], besides that students are more stimulated to follow the

learning process so that students can be more active, and teachers can more easily without the development of each student. In addition, this application strongly encourages active learning in the classroom. Students are very satisfied with learning using the Nearpod application, and learning is more integrated and focused.

CONCLUSION

Based on the results of data analysis and discussion, the results of statistical analysis showed that the average learning outcomes of the experimental class were 75.53, which was higher than the control class, which was 71.28, and the value of Z_{count} (3.88) $>$ Z_{table} . (1.64), it can be concluded that H_0 is rejected and H_1 is accepted, meaning that there is an influence of Nearpod interactive media in the discovery learning model on the learning outcomes of students in class XI MIA MAN 4 Bone on acid-base material.

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