Implementation of the Environmental Exploration Learning Model (JAS) Assisted by Google Lens on the Scientific Literacy of Taman Mulia High School Students

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Abstract: This study aims to determine: (1) the difference in science literacy of class X students on plantae material with the Explore Nature Around (JAS) model assisted by google lens, (2) the effect of applying the Explore Nature Around (JAS) learning model assisted by google lens on students' science literacy on plantae material class X Taman Mulia. This type of research is Quasi experiment with Nonequivalent Control Group Design. The population of this study were students of class X Taman Mulia. The sample consisted of two classes determined by random sampling technique. The instruments used consisted of science literacy tests and learning process observation sheets. The data were analyzed by t-test, the analysis was carried out using SPSS version 29.01 for windows which previously conducted homogeneity and normality tests at a significant level of 0.05. Based on the results of the analysis, the conclusions were obtained. (1) The difference in science literacy of class X students on plantae material with the Explore Nature Around (JAS) model assisted by google lens (2) the effect of applying the Explore Nature Around (JAS) learning model assisted by google lens on students' science literacy in plantae material class X Taman Mulia.

Keywords: Exploring the environment; Google lens; Scientific literacy

Introduction

This is a rapid development in science and technology on the 21stThis century has had a huge impact on many aspects of people's lives, including the education system. Due to the influence of global science and technology and developments over time, education has become the field that responds most quickly to advances in science and technology. Therefore, the government stated in Law no. 20 of 2003, in fact national education must always adapt to the needs of the times through paragraph 2 of article 1 of National Education System (Rahayu et al., 2022). Learning activities are the ultimate goal of development education in Indonesia. Effective and enjoyable learning is needed, both literacy and education. Based on Raehanah et al. (2020), scientific literacy is the ability to apply scientific ideas to everyday situations, explain scientific events, and characterize phenomena based on scientific data. In order for students to be able to use science in everyday life and understand science as a concept, it is very important for them to have scientific literacy. The PISA study can be used to measure scientific literacy. The OECD developed the PISA evaluation system to evaluate education systems in 72 countries around the world (Asdarina et al., 2020). In Indonesia, the condition of children's scientific literacy development in general is not very promising. PISA 2018 is proof of the importance of this. PISA is a representative study that aims to describe the condition of scientific literacy throughout the country. Indonesian students got an average score of only 396 on the moment science literacy test. In 2018, Indonesia was

ranked 70th out of 78 countries assessed by PISA. This figure shows a decrease from the 2015 PISA results, where the average scientific literacy score for Indonesian students was 403, which placed Indonesia in 62nd place out of 70 countries. PISA data from year to year shows that the scientific literacy skills of Indonesian students are not always in the best condition (Yusmar et al., 2023).

Many factors cause the low level of scientific literacy of Indonesian students, such as the curriculum, the education system, and the inadequate use of appropriate learning models by teachers. According to the results of interviews conducted with biology teachers at Taman Mulia High School on February 9 2024, at the Study teaching stage using the Problem Based Learning learning model, it was discovered that there were problems regarding scientific literacy, students tended to be passive and bored, because learning is only done in class, especially on kingdom plantae material. Education cannot be separated from the teacher's role in organizing, implementing and evaluating science lessons. Combining teachers' scientific concepts and choosing appropriate teaching methods will be able to provide students with a comprehensive understanding of science literacy. An appropriate learning model is a learning model that can encourage students to master material that is in accordance with the characteristics of biology learning, especially kingdom plantae material. The 2013 curriculum is a curriculum that has been implemented within the Ministry of National Education since 15/7/2013 and within the Ministry of Religion implemented since 18/7/2013 based on the Circular Letter of the Director General of Education No. SE/DJ.I./PP.00/50/2013 concerning implementation of the 2013 curriculum in Madrasas/schools. After previously reaping many pros and cons from observers, teachers and parents. The 2013 curriculum, which is based on character and competency, among other things, wants to change the pattern of education from an orientation towards results and educational material as a process, through an integrative thematic approach. Therefore, by learning as much as possible involving students, so that they are able to explore to form competencies by exploring various potentials and scientific truths (Ikhsan et al., 2018).

One model of education that requires natural educational development, such as learning from various resources in the environment, is exploring the surrounding nature. Utilizing the environment around students as an object for biology learning is known as the "exploration" learning model of the natural environment. Exploring the Natural Environment (JAS) is learning that is carried out in the environment around students as a biological learning object whose phenomena can be studied with scientific work. The

approach is carried out through observation or exploration which can create a more interesting learning atmosphere (Rosalia et al., 2021). The steps in the learning process using the Environmental Exploration (JAS) approach include exploration of the surrounding environment, constructivism, scientific process, formulating hypotheses, edutainment, discussion and presentation of results (Aminah et al., 2023). Exploring the natural surroundings requires students to be active in the surrounding environment, and is required to work together well in groups so that students are more active in learning (Putra, 2021). Students are allowed to be actively involved in developing their ideas in the content taught, and they can apply this knowledge to solve problems that commonly arise in their daily lives. Therefore, one option to assess students' scientific literacy in biology learning, especially in kingdom plantae material, is to choose an explorative learning model. By using the JAS learning approach, a number of studies have shown good results on students' scientific literacy. One such study Santoso et al. (2021) provides very positive and noteworthy results in students' scientific literacy. When using a learning model, educators also need to consider the use of complementary materials that will make it easier to apply the model in the classroom.

Google Lens is an ICT-based learning resource that can be used. By using the camera capabilities on each student's smartphone, the Google Lens program can help students quickly identify living creatures in the environment (Masropa et al., 2022). Google Lens offers benefits to improve shared teamwork, connecting engagement, and suitability for students with limited spatial abilities (Wakhidah et al., 2024). The JAS learning model provides more real learning by utilizing the surrounding natural life as a learning object through observation so that it can be collaborated with Google Lens to obtain information by documenting directly so that it can increase students' scientific literacy regarding kingdom Plantae material in the material, surrounding environment. Researchers are interested in researching research entitled "Application of Learning Models." Exploring the Environment (JAS) Assisted by Google Lens Scientific Literacy of Taman Mulia High School Students" by paying attention to the problems mentioned above. The aim of this research is to determine the related differences in assisted learning. The Google Lens JAS model and problem-based learning assisted by learning videos, as well as finding out the influence of the Google Lens assisted JAS model on students' scientific literacy at Taman Mulia High School.

Method

Types of research this that is approach quantitative, with using the quasi experimental method. This research was carried out in the even semester of 2024 which will be carried out in class X SMA Noble Park. The population in this study consisted of 4 classes ie class X IPA (25 students), XIPS1 (27 students), 2 classes, viz class X IPS 1 as class experiments and class X IPS 2 as class control, be sample study. Form experiments used namely nonequivalent control group design (Sizi et al., 2021).

Table 1. Research Design Nonequivalent Control Group Design

Pretest	Treatment	Posttest
O_1	X	O_2
O_3	Y	O_4

Data Collection Technique
Measurement

Learning outcomes measured twice: once before therapy (pretest) and once after treatment (posttest). There is ten pretest and posttest questions, all of which shaped choice double.

Observation

The purpose of technique observations in research This that is For see How researcher carry out plan learning - or no - while monitor learning students in class.

Interview

In this research, researchers used open or free interviews.

Data Collection Tools
Science Literacy Test

This research uses a multiple choice written exam as a test format. A total of ten test questions were given in the experimental class and control class before teaching (pretest) and after teaching (posttest).

Observation Sheet

Observation sheet used ie sheet observation addressed closed For used in class experiments and classes control. Activity learning and implementation learning including in sheet observation this.

Validity

Validity content, which includes lesson plans and instruments form question test results learn, use as validity in study this. Compare material lesson with fill device learning and instruments is how to test validity this done. Following formula validity multiple choice using the Pearson product moment correlation formula (Devi et al., 2021).

$$\text{rxy} = \frac{n\sum xy - (x)(y)}{\sqrt{\{n\sum x^2 - (x)^2\}\{n\sum y^2 - (\sum y)^2\}}} \quad (1)$$

Reliability

Students who have follow exam kingdom plantae material follows exam fork now level its reliability. The test is counted using the *Kuder Richardson* formula 10 multiple choice questions. The reliability formula is as follows (Ketaren et al., 2024).

$$\text{rKR20} = \frac{K}{K-1}\left(1 - \frac{\sum pq}{s}\right) \quad (2)$$

Level of Difficulty

A known relationship as Index Difficulty used for represent level difficulty item question. If a question No too easy or too difficult, then level the difficulty considered very good. Formula following used For determine mark Index Difficulty (Eliza et al., 2022).

$$\text{IK} = \frac{X}{SMI} \quad (3)$$

Differentiating Power

Ability something item question test results Study For differentiate between participant capable test superior and inferior known with term Power differentiator. So you know Power differentiator ie with use formula (Lovisia, 2018).

$$\text{DP} = \frac{XA - XB}{Xmaks} \quad (4)$$

Distractor

Students who provide the wrong answer will be placed in a way random on items good question. On the other hand, questions that have bad distractor will chose with no way the same. Formula following used For get index distractor (Hindriyani et al., 2024).

$$\text{IP} = \frac{P}{(N-B)/(n-1)} \times 100\% \quad (5)$$

Documentation

Taking pictures from research, both in or outside room class, incl in documentation this.

Data Analysis Technique
Analysis Prerequisite Test

Normality and homogeneity test used for carry out prerequisite tests. With use Shapiro-Wilk approach, normality test the goal for ensure whether the data is distributed in a way regular or Nob. With criteria as following, test options and conclusions made on a level significant 0.05: data is normally distributed if mark

probability (p>0.05), and data not normally distributed if mark probability (p<0.05). SPSS version 29.01 for Windows was used For help testing normality (Buchari et al., 2021).

Researcher using SPSS version 29.01's Homogeneity of Variance Test in One-way anova for ensure homogeneity. Significance Level α = 0.005 was used. Data can be classified as homogeneous If mark analysis of homogeneity test data more from or The same with α, and not homogeneous If not enough from or The same with α (Sianturi, 2022).

T-test

One of technique testing for statistical tests parametric is the T-test. Known statistical testswith this T test used so know related extent of contribution every variable independent in give explanation on variable dependent. A significance level of 0.05 (α = 5%) was used For T testing. The null hypothesis (H0) is valid and a hypothesis alternative (H1) is rejected in testing hypothesis, which is carried out in accordance criteria if sig value is more from 0.05. The alternative hypothesis (H1) is valid and hypothetical zero (H0) is invalid if sig value is less from 0.05 (Wahyudi et al., 2023).

Effect Size

The effect size test uses the following formula (Khairunnisa et al., 2022).

Results and Discussion

Results

Pretest and posttest data were obtained in class experiments using the JAS model assisted by Google Lens, and in the classroom control that uses a learning model based problem, accordingly results existing research researched. Two different classes used for study this: class X IPS I, which is whole consists of 27 students and functioning as class experiments, and class X IPS II, which whole consists of 28 students and functioning as class control.

Table 2. Results of Science Literacy for Experimental and Control Classes

Class	Average value		Completion Percentage
	Pretest	Posttest	
Experiment	32.59	63.33	75.41
Control	57.85	62.14	45.21

Analysis Prerequisite Test

After A normality test was carried out with *Shapiro Wilk in the experimental class*, obtaining *pretest* and *posttest* scores in class X IPS I with sig 0.100 > 0.005 and the control class obtained *pretest* and *posttest scores* in class it is normally distributed. Then a homogeneity test was

carried out to obtain a sig result of 0.509>0.005, so the two data had a homogeneous distribution. After carrying out the t test, the results obtained sig 0.001<0.005, there was a significant difference between the experimental and control classes . Then an effect size test was carried out, it was found that the average scientific literacy gain value for the experimental class was 30.7 while the average scientific literacy gain value for the control class was 32.5 with a standard deviation for the control class of 13.56. So the result was 0.12 (high criteria).

Discussion
Students' Scientific Literacy

According to Khotimah (2020) science literacy is the ability to apply scientific ideas in everyday situations, explain scientific events, and characterize these phenomena based on scientific data. Science literacy supports learners to create their own procedures based on the investigations they conduct (Angraini, 2014). Before receiving Google Lens assistance to use the JAS learning model, students in the experimental class had an average pretest score of 32.59. After being given the treatment, their average posttest score was 63.33. In the control class before being given treatment using the Problem Based learning model, the average student pretest was 57.85, then after being given treatment, the average student posttest was 62.14. The low science literacy of students is also influenced by the selection of learning models, this is also supported by research conducted Sutrisna (2021) which states that the tendency to use conventional learning models causes less than optimal learning activities.

Differences in Science Literacy of Experimental and Control Classes

In accordance t test results that state the sig value is 0.001 < 0.005, you can concluded that class experiments and classes control different in a way significant. Students in class experiment can succeed because exists connection one each other is possible they for each other share information, support one each other inside group during discussion, and exchange thought. Google lens functions to make it easier for students to find out information about plants in the school environment. The essence of activity education is learning, which is not can released from teacher's duties. Level teacher skills as well selecting appropriate learning models and media in effort develop results study student. Methodology learning based problem used in class control for facilitate learning. Students in class control own literacy more science bad than class experiment because they more passive and concerned self Alone during the learning process. Goals on paradigms learning based problem that is for give student required skills and knowledge.

For solve problem with request they work through problem in a way gradually. Based on effect size data analysis obtained a result of 0.12 (High Criteria), it can be said that learning with the JAS model assisted by Google Lens has an influence on student learning outcomes. With export and engage direct with material learning in the environment around , paradigm learning explorative possible student For own experience direct in the learning process through invention (Aly, 2022). For grow outlook diverse thinking in all students and help they understand various concept and how apply it to real world situations , learning models This give strong emphasis on activities connected learning with real world scenario.

The Influence of the JAS Learning Model Assisted by Google Lens

Based on analysis of the effect size test data that has been carried out done obtain result 0.12 (High Criteria), can said learning with the Assisted JAS model *Google Lens* influential towards scientific literacy Taman Mulia High School students. With export and interact direct with material learning in the environment around, paradigm learning explorative possible student. For own experience direct in the learning process through discovery. For facilitate outlook diverse thinking from all students and for teach they How connect different concept with real world problems, learning models It places great emphasis on implementing connected learning with real world scenario.

Conclusion

The data were analyzed by t-test, the analysis was carried out using SPSS version 29.01 for windows which previously conducted homogeneity and normality tests at a significant level of 0.05. Based on the results of the analysis, the conclusions were obtained. (1) The difference in science literacy of class X students on plantae material with the Explore Nature Around (JAS) model assisted by google lens, (2) the effect of applying the Explore Nature Around (JAS) learning model assisted by google lens on students' science literacy in plantae material class X Taman Mulia.

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