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The Effect of Guided Inquiry Assisted by Google Classroom on the Scientific Literacy at SMA Negeri 1 Kwanyar

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Abstract

Scientific literacy is a crucial ability for work in the digital age. The aim of this study was to ascertain the impact of guided *inquiry using Google Classroom on students' scientific literacy at SMA Negeri 1 Kwanyar. For the experimental class, which consisted of 104 students over 4 classes X MIPA, a pretest-posttest non-equivalent group design was adopted. A test for equivalency was used to choose the samples. The instruments used in this study are descriptive tests that make reference to scientific literacy indices. Analysis of covariance was used for the analysis (Anakova). The findings of this study show how guided inquiry using Google Classroom has an impact on pupils at Kwanyar 1 Public High School's scientific literacy.*

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Abstrak

Literasi sains merupakan kemampuan yang sangat penting untuk bekerja di era digital. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh inkuiri terbimbing berbantu *google classroom* terhadap literasi sains siswa SMA Negeri 1 Kwanyar. Desain eksperimen menggunakan eksperimen semu (*quasi experiment*) dengan rancangan *pretest−post-test non-equivalent group design* Populasi berjumlah 104 siswa dengan jumlah total 4 kelas X MIPA. Pemilihan sampel dilakukan dengan uji kesetaraan. Instrumen dalam penelitian menggunakan tes uraian yang mengacu pada indikator literasi sains. Analisis menggunakan analisis kovarian (Anakova). Hasil yang diperoleh dalam penelitian yaitu adanya pengaruh inkuiri terbimbing berbantu *google classroom* terhadap literasi saiins siswa SMA Negeri 1 Kwanyar.

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1. INTRODUCTION

In the 21st century there have been significant changes in aspects of life, including education. Students in this century are prepared to face new and changing knowledge and skills compared to before(Geisinger, 2016). This skills development includes technological advances, multicultural society, human mobility, global communication, social networking, innovation, inclusiveness, creativity and digital literacy.(Saleh, 2019).

One of the literacy skills needed in the digital era is scientific literacy(Turiman et al., 2012). Applying scientific ideas in everyday life requires scientific literacy. Defining and explaining scientific phenomena based on scientific data is necessary in scientific literacy(Aditya & Indana, 2021). PISA defines scientific literacy as the capacity to actively engage with issues and concepts in

the field of science. In addition, this understanding requires the ability to assess and plan scientific investigations, evaluate facts and evidence scientifically in everyday life, and explain scientific events.(OECD, 2017a). Indonesian students aged 15 years in a test were ranked 64th in the world for scientific literacy out of 65 countries involved according to the results of PISA (Program for International Student Assessment) by the OECD (Organization for Economic Co-operation and Development). Indonesia's score in scientific literacy was 382. This shows that the score is lower than the OECD standard value of 500(OECD, 2018). This means that Indonesian students' scientific literacy skills are significantly lower than other participants.

One of the reasons why students' low scientific literacy is the development of the definition of scientific literacy. Scientific literacy in modern times is known to be much more complex and difficult to achieve. This means that knowledge alone is not enough to define scientific literacy, but also includes the process of conducting scientific research, including how to ask questions, test and carry out analytical activities.(Klucevsek, 2017). Based on these developments, a learning model is needed that can accommodate these activities. The model that can be used is guided inquiry.

In the inquiry learning model, students identify scientific principles through cooperative work activities to build more detailed knowledge(Wenning, 2012). Learning using inquiry considers questions or problems by encouraging investigative activities by students. The inquiry learning model has several levels. One level that can be used during learning activities is guided inquiry. Teachers in the guided inquiry model provide problems to be investigated but students decide the method for solving the problem. Guided inquiry allows students to gain in-depth understanding personally through various sources of information obtained(Kuhlthau, 2010).Chatila & Sweid (2018)states that learning using guided inquiry is able to develop all aspects of scientific literacy. Apart from that, the guided inquiry learning model also has an influence on the scientific literacy of high school students(Rosa, 2021).

Guided inquiry learning can be carried out better by using special applications. One special application that can be used is Google Classroom. Google Classroom is an application that makes it easier for teachers and students to create, group and divide assignments without being time bound(Marbun & Sinaga, 2021). Implementing the guided inquiry learning model with the help of Google Classroom can expand learning activities and optimize time for teaching and learning activities(Uliya & Muchlis, 2022).

From the explanation above, research was conducted entitled, "The Influence of Guided Inquiry on the Scientific Literacy of Students at SMA Negeri 1 Kwanyar". The aim of this research is to determine the effect of guided inquiry assisted by Google Classroom on the scientific literacy of students at SMA Negeri 1 Kwanyar.

2. RESEARCH METHOD

The research design is quasi-experimental. A pretest−post-test non-equivalent group design research design was used. The experimental class and control class were tested first at the beginning of learning with an initial test. The control class adopted the conventional learning mode assisted by Google Classroom and the experimental class adopted the guided inquiry learning model assisted by Google Classroom. Both classes then completed a final test. There are 104 students in class X consisting of class X MIPA. Sampling used an equality test, Class X MIPA 1 is an experimental class that uses guided inquiry learning assisted by Google Classroom, Class

Data collection was carried out using a description test with indicators of scientific literacy, namely: 1) explaining scientific phenomena scientifically, 2) designing and evaluating investigative methods that lead to scientific knowledge, and 3) organizing, analyzing and interpreting quantitative data and scientific information. adapted fromGormally et al., 2012; OECD, 2017b).

Data analysis is carried out by preparing data on the results of the initial and final test scores that have been obtained. These values are then analyzed using prerequisite tests and hypothesis tests.

Test the prerequisites using the normality test and homogeneity test with the help of SPSS for Windows. The data normality test uses the Komolgorov-Smirnov test to determine whether the data distribution is normal or not. Levene's Test of Equiallity of Error Variances is used for the homogeneity test to determine the homogeneity of variance. Finally, a hypothesis test was carried out using covariance analysis (Anakova)

3. RESEARCH RESULTS AND DISCUSSION

3.1.Research result

Table 1. Average Results of the Preliminary Test and Final Test of Scientific Literacy for Control Class and Experimental Class Students

Class	Average		Enhancement (%)
	Initial Test	Final Test	
Control (Lecture and Google classroom)	25.6	37.8	16.2
Experiments (Guided inquiry and Google classroom)	28.3	51.1	31.8

Based on Table 1, it can be seen that there was an increase in the average in the control class and experimental class. The average increase in the control class was 16.2% while in the experimental class it was 31.8%. This shows that the improvement in the experimental class was higher compared to the control class. The results of the anacova test in the initial test and final test are shown in Table 2.

Table 2. Anakova Test Results on the Effect of Guided Inquiry Assisted by Google Classroom on Students' Scientific Literacy Abilities

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1219.352a	14	87,097	11,086	,000
Intercept	7697,592	1	7697,592	979,812	,000
Pretest	977,733	13	75,210	9,573	,000
Class	139,110	1	139,110	17,707	,000
Error	298,535	38	7,856		
Total	12416,000	53			
Corrected Total	1517,887	52			

a. R Squared = .803 (Adjusted R Squared = .731)

Table 2 shows the results of the Anakova test, the scientific literacy value has a significance level of 0.000. Significance value <0.05. Thus, H0 is rejected and H1 is accepted. So it can be concluded that there is an influence of guided inquiry learning assisted by Google Classroom on students at SMA Negeri 1 Kwanyar.

3.2.Discussion

Based on the results of the analysis, it is known that there is an influence of guided inquiry learning assisted by Google Classroom on the scientific literacy of students at SMA Negeri 1 Kwanyar. This can be seen from the pretest and posttest scores that have been carried out.

Learning using guided inquiry assisted by Google Classroom shows better results compared to conventional learning.

The first stage in guided inquiry learning is investigating phenomena. This phenomenon was broadcast via Google Classroom. Activities investigating this phenomenon can help to improve scientific literacy indicators, namely explaining scientific phenomena scientifically. The video displayed is able to accommodate students to see a phenomenon. This activity is very important to recognize, supply, and evaluate various natural events that occur, as well as the technology needed in the twenty-first century(OECD, 2017b)

The second stage in learning is focusing questions. At the beginning of the lesson the teacher asks students to make several questions first via Google Classroom, then focuses on questions that are appropriate to the learning topic. This shows that students need to pay close attention to the video being shown to be able to make questions. The ability to understand is necessary in understanding the focused questions so that students can discuss scientific situations(Shaffer et al., 2019).

The stage of planning an investigation is the third stage. In this stage, students answer the hypotheses that have been proposed in questions created by the teacher. Investigation planning activities accommodate students in scientific literacy indicators, namely designing and evaluating investigation methods that lead to scientific knowledge. Proposing the hypothesis obtained is a form of student effort which is then evaluated from the findings obtained based on the scientific activities carried out(Khalaf & Zin, 2018).

Activities carrying out investigations are carried out to improve students' abilities in scientific literacy indicators, namely designing and evaluating investigation methods that lead to scientific knowledge. Students in this activity make observations by looking for relevant sources, namely through books or other means, by completing the tables provided. This observation activity helps students to carry out direct learning experiences to discover a concept. This direct experience helps students to understand a concept(Jensen, 2014).

The fifth activity is analyzing data and evidence. This activity helps to improve indicators of organizing, analyzing and interpreting quantitative data and scientific information. Data analysis carried out by students helps them to be more active in discovering the concepts to be studied(Taofiq et al., 2018).

The sixth activity is building new knowledge. In this activity, indicators that can be improved are organizing, analyzing and interpreting quantitative data and scientific information. The stage of building new knowledge requires students' skills to be able to process previously discovered concepts and concepts they already have after carrying out observation activities. This stage accommodates guided inquiry learning to reduce misunderstandings of the concepts that have been learned(Pikoli, 2020).

The seventh activity is communicating new knowledge. In this case, communicating can improve indicators, namely organizing, analyzing and interpreting quantitative data and scientific information. Students carry out presentation activities then send the results of the presentation obtained to the available Google Classroom. This activity helps students to practice all the scientific skills they have(Heather & Randi, 2008).

Based on the results of the analysis above, the stages of inquiry learning assisted by Google Classroom have an effect on scientific literacy.This is in line with Mardianti et al. (2020), which shows the influence of guided inquiry learning on scientific literacy. In addition, the use of Google Classroom for guided inquiry learning affects students' scientific literacy(Rosa, 2021).

4. CONCLUSION

Based on the results and discussion, the conclusions obtained are aand the influence of guided inquiry assisted by Google Classroom on the scientific literacy of students at SMA Negeri 1 Kwanyar.

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