The Impact of the PBL Model on Senior High School Student Learning Outcomes Using Google Classroom

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Abstract: The Impact of the PBL Model on Senior High School Student Learning Outcomes Using Google Classroom. This study aims to determine the effect of the problem based learning model with the help of google classroom media on the learning outcomes of high school students on the subject of oxidation-reduction reactions at SMAN 1 Siantar. This type of research is an experimental study with a pretest-posttest control design. The data collection of student learning outcomes was obtained from the pretest and posttest scores. This study resulted in the average data of student learning outcomes from the posttest in the experimental class that was greater than the control class, namely 62 and 50. Data analysis used the T-Test test which resulted in a significance value of learning outcomes less than 0.05, namely 0.003. Based on this analysis, it can be concluded that learning using the PBL model with the help of google classroom media has a significant effect on senior high school student learning outcomes on oxidation-reduction material at SMAN 1 Siantar.

Keywords: Google Classroom, Learning Outcomes, PBL

Abstrak: **Pengaruh Model PBL Pada Siswa SMA Terhadap Hasil Belajar Menggunakan Google Classroom**. Penelitian ini bertujuan untuk mengetahui pengaruh model problem based learning dengan bantuan media google classroom terhadap hasil belajar siswa SMA pada materi reaksi reduksi - oksidasi di SMAN 1 Siantar. Jenis penelitian ini adalah penelitian eksperimen dengan pretest-posttest control design. Pengumpulan data hasil belajar siswa diperoleh dari nilai pretest dan posttest. Penelitian ini menghasilkan data rata-rata hasil belajar siswa dari posttest pada kelas eksperimen lebih besar daripada kelas kontrol, yaitu 62 dan 50. Analisis data menggunakan uji T-Test yang menghasilkan nilai signifikansi hasil belajar kurang dari 0,05, yaitu 0,003. Berdasarkan analisis tersebut, dapat disimpulkan bahwa pembelajaran menggunakan model PBL dengan bantuan media google classroom berpengaruh signifikan terhadap hasil belajar siswa SMA pada materi reduksi- oksidasi di SMAN 1 Siantar

Kata kunci: Google Classroom, Learning Outcomes, PBL

▪ **INTRODUCTION**

The formal foundation of education in Indonesia is the Law of the Republic of Indonesia Number 20 of 2003 Article 1 paragraph 1, which states that education is a planned effort to create a learning atmosphere and learning process that can develop potential in students and have religious spiritual strength., noble character, self-control, personality, intelligence, and skills that are useful for o (They, 2020)Education is a deliberate effort in learning that encompasses spiritual, noble character, information, abilities, and habits that are transmitted through teaching, training, or study in order to develop students' potential.

The National Examination (UN) is a national assessment system for primary and secondary school students. The UN intends to equalize the quality of education between regions in Indonesia, as a basis for selection for the next level of education, and to increase the quality of education, according to the Ministry of Education and Culture's article on "Changes in National Examination Policy." Indonesian, English, mathematics, and the characteristics of the majors are among the courses assessed at the high school level. Physics, chemistry, and biology are the three majors in the science department at the high school level. In the report on the results of the 2019 national exams throughout Indonesia, the Ministry of Education and Culture recorded the average UN scores for physics, biology, and chemistry in the following order: 46,352; 50,449; and 50,831.

In a learning setting, learning is the process of students interacting with educators and learning resources (Suardi, 2018). Effective learning occurs when students engage in their own learning activities. The learning process is an activity in the classroom that involves changing information, attitudes, and skills. In a teaching and learning encounter, activity is a crucial component. Physical and mental tasks are included in this learning activity. As a result, student learning activities are a collection of interconnected physical and mental activities that help to establish an ideal learning environment.

Learning outcomes are a set of assessments of the learning process that show if the learning activities were effective, as evidenced by changes in student behavior, abilities, and knowledge. The cognitive, emotional, and psychomotor domains all contribute to learning outcomes. Learning outcomes can also be thought of as a sequence of assessments of the learning process, each of which necessitates the use of a tool. Tests are the most effective instrument for assessing learning results. Because the test reveals the student's level of understanding of the subject delivered by the teacher. The test can be either subjective or objective.

Several studies have found an increase in student learning results, with some mentioning it in terms of cognitive and others mentioning it in terms of cognitive, emotional, and psychomotor outcomes. The first study was published by (Argaw et al., 2016). According to his findings, the learning process employing a problem-based learning (PBL) model affects learning results. The control and experimental classes' post-test mean scores are 38.54 and 50.25, respectively. The pre-test scores for the control and experimental courses were 22.20 and 22.25 before the PBL model was applied to the experimental class.

The third study (Putra & Bektiarso, 2017)found that the PBL paradigm can help students enhance their cognitive learning results. The average cognitive learning result score of the experimental class students was 72.64, while the control class students' average cognitive score was 65.24. The PBL paradigm can increase student learning results, according to this study, because the challenges are based on physics problems that students encounter on a regular basis.

The problem based learning (PBL) model, as previously mentioned, is a learning approach in which students are regarded as problem solvers who can build knowledge rather than passive users of knowledge. Students must not only understand the concepts important to the problem at hand, but also receive learning experiences connected to the skills of applying the scientific method to solve problems and promoting critical thinking patterns in the PBL model. This paradigm is a learning innovation that aims to assist students gain a deeper understanding of theory through empirically based learning experiences.

Anything that is useful for delivering and disseminating messages in a planned manner so that a suitable learning environment is created and learning recipients may carry out the learning process successfully and efficiently is referred to as learning media. Google Classroom is one of the learning media that may be used. Google Classroom is a Google application in the form of an online or virtual classroom that can help teachers improve their interaction and communication with their students (Gunawan et al, 2017). According to their research, Google Classroom can help teachers improve their interaction and communication with their students. For students, Google Classroom offers its own set of interests and characteristics. Students may learn without being constrained by time, and they can use Google Classroom to ask for help with things they don't understand.

The problem-based learning approach has a number of flaws, one of which being its inefficiency throughout the learning process. In general, this PBL paradigm necessitates a significant amount of time, thus learning in class is frequently insufficient. To address the issue of learning efficacy, researchers chose Google Media Classroom. This is based on past research that shows Google Classroom can assist teachers in getting students to collect assignments on time. The researcher also expects that by implementing the PBL paradigm in the classroom, the media can assist in overcoming the issue of learning time effectiveness. Because Google Classroom has its own set of interests and characteristics, the author expects that this medium will be able to alleviate student boredom while simultaneously increasing student learning activities in the classroom.

Previous research by (Argaw et al., 2016), (Himah et al., 2015), Putra, et al (2017), and (Farisi et al., 2017)), which discussed the effect of problem-based learning models on improving learning outcomes, and research by (Gunawan & Sunarman, 2018), who investigated the development of Google Classroom in problem solving skills and learning effectiveness, found that there was a positive relationship between problem-based learning models and learning effectiveness. As a result, a study titled "The Effect of the PBL Model on High School Students' Learning Outcomes Using Google Classroom" is required.

- **METHOD**

This type of research is a experimental research. The study used a pretest-posttest control design, which meant that before receiving therapy, both research samples were given a pretest as an initial test to re-measure students' initial abilities, which were thought to be almost equal. After that, the experimental class was taught the PBL paradigm using Google Classroom media, while the control class was taught the traditional style. Following treatment, both classes were given a posttest to assess students' final abilities.

In the even semester of the 2019/2020 academic year, this study was carried out at SMA Negeri 1 Siantar. Oxidation and Reduction Reactions were chosen as the subject. Using a purposive sampling region, the research sample was established. One Way

ANNOVA was used to identify the study sample after the homogeneity test was completed with the SPSS program. All populations, especially class X IPA, are tested using the value of the prior material (mechanical waves). Cluster random sampling was used for sample selection (samples were selected randomly).

The sample was divided into two classes, with class X IPA 3 serving as the experimental class and class X IPA 5 serving as the control class. Tests, interviews, observation, and documentation were used to collect data in this study. The Independent sample t-test on SPSS was used to assess data analysis strategies for learning activities and student learning outcomes to see if there was a significant difference between student learning outcomes in the experimental and control classes. The post-test data was utilized to assess student learning results. The following equation is used in value processing to gather data on students' pretest scores and learning outcomes:

$$\text{Results of the scoring} = \frac{\varSigma \, the \, grade \, of \, each \, student}{\varSigma \, maximum \, score}$$

▪ RESULT AND DISCUSSION

This study aims to determine the effect of the problem based learning (PBL) model on learning outcomes using google classroom on the material of oxidation reduction reactions. Based on the research that has been done, the data obtained from student learning outcomes.

Data on student learning outcomes were obtained after being treated with the PBL learning model with google classroom media obtained from the post-test results. The pre-test scores were used to determine and re-check the initial ability of students' learning outcomes in the experimental class and control class. The following is data on student learning outcomes in the form of average pre-test scores and post-test scores in both classes, which can be seen in Table below.

Tabel 1. Score of Student Pretest and Posttest Score

	Class	Average	standard deviation
	Experiment	36	8
Pretest	**Control**	32	8
	Experiment	62	16
Posttest	**Control**	50	12
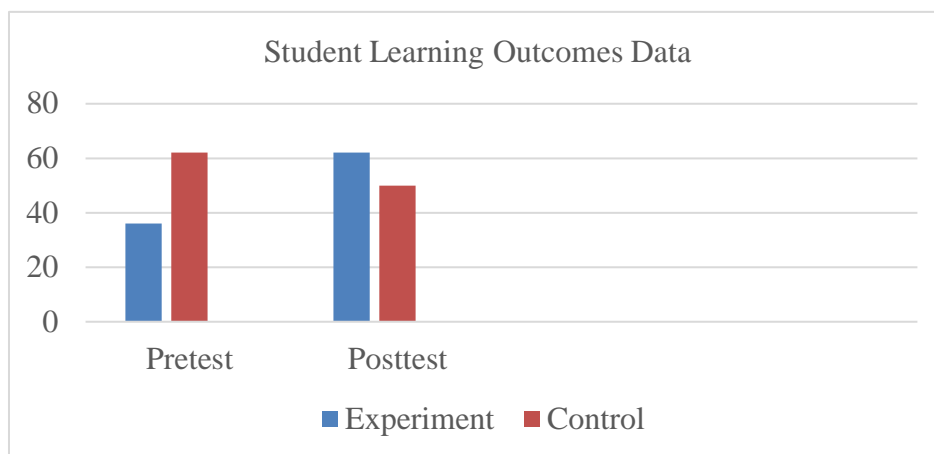
Figure 1. Pretest and Posttest scores on

The average pre-test scores in the experimental and control classes are nearly identical, as shown in table 2 and figure 2. This suggests that the pupils in the two classes have similar starting talents. The experimental group has a higher average value than the control group. The value of Sig. (2-tailed) on equal variance assumption is 0.003, which is classed as less than 0.05, according to the results of the study of the independent sample T-test. When the significance value is less than 0.05, H0 is rejected and Ha is approved, according to the decision-making process. In other words, the average value of student learning outcomes in the experimental and control classes differs.

According to the preceding description, there is a substantial difference between student learning results using the problem-based learning (PBL) model with Google Classroom media and the learning model usually utilized in SMA Negeri 1 Siantar. This is in line with research (Argaw et al, 2017) that claims the PBL approach has an impact on student learning results. Several things can contribute to this affect. These factors include problems from everyday life to help students understand the material, student-centered learning to give students direct experience in solving problems, and using Google Classroom to help teachers make learning time in class more effective, overcome classroom boredom, and increase teacher-student interaction. According to research (Farisi & Hamid, 2017), the use of LKPD can assist students in solving challenges set by the teacher. This is consistent with the findings of the study, which included providing LKS to students via Google Classroom.

Because of student participation during learning, the problem-based learning (PBL) model with Google Classroom media can improve students' excitement for learning as well as their skills in expressing opinions or asking questions, as discussed above. Students become accustomed to having curiosity and seeking solutions to challenges independently or in groups as a result of their independence being created. Students' social skills improve in these groups, causing them to be more concerned about their friends. Students will find it easier to grasp and recall material if it is based on real-life issues. Google Classroom also assists teachers in increasing the effectiveness of classroom learning time, increasing teacher-student engagement, and overcoming student boredom while learning.

▪ **CONCLUSION**

Based on the findings of the research and discussions, it can be concluded that using the Problem Based Learning (PBL) model with Google Classroom media has a substantial impact on student learning outcomes on oxidation-reduction reaction material at SMAN 1 Siantar.

Based on the findings of the research and discussion, teachers can utilize the PBL model and Google Classroom media to teach chemistry at school by giving students an introduction or brief training on Google Classroom. For additional researchers, developing a problem-based learning paradigm using Google Classroom media is still required in this study.

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