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# The Effect of Canva-aided Problem Based Physics Learning toward Students' Conceptual Understanding of Static Fluid: A Case of SMAN 7 Bengkulu

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**Abstract:** This research was conducted with the aim of seeing and describing the influence of the Canva-assisted Problem Based Learning Model on Understanding Physics Learning Concepts at SMAN 7 Bengkulu City. The sampling technique in this research was purposive sampling and class XI IPA 3 was chosen as the experimental class and class XI IPA 5 as the control class. The design in this research is Nonequivalent Control Groups Design. The research instrument used was a concept understanding test. The results obtained in this research indicate the influence of the Canva-assisted Problem Based Learning Model on Understanding Physics Learning Concepts at SMAN 7 Bengkulu City. The hypothesis test used in this research is the Mann Whitney Test on the basis of decision making if the Asymp value. Sig (2-tailed) < 0.05 then the hypothesis is accepted. The magnitude of the influence of the problem based learning model assisted by Canva on the understanding of physics learning concepts at SMAN 7 Bengkulu City, calculated by calculating the effect size, obtained an influence of 3.12, meaning that the influence given is very high.

**Keywords:** understanding concepts, problem based learning, effect size.

***Abstrak:*** *Penelitian ini dilakukan bertujuan untuk melihat dan mendeskripsikan Pengaruh Model Problem Based Learning Berbantuan Canva Terhadap Pemahaman Konsep Belajar Fisika Di SMAN 7 Kota Bengkulu. Teknik pengambilan sampel dalam penelitian ini adalah purposive sampling dan terpilihlah kelas XI IPA 3 sebagai kelas eksperimen dan kelas XI IPA 5 sebagai kelas kontrol. Desain dalam penelitian ini adalah Nonequivalent Control Groups Design. Instrumen penelitian yang digunakan adalah berupa tes pemahaman konsep. Hasil yang didapatkan pada penelitian ini menunjukkan adanya pengaruh Model Problem Based Learning Berbantuan Canva Terhadap Pemahaman Konsep Belajar Fisika Di SMAN 7 Kota Bengkulu. Uji hipotesis yang digunakan dalam penelitian ini adalah Uji Mann Whitney dengan dasar pengambilan keputusan jika nilai Asymp. Sig (2-tailed) < 0,05 maka hipotesis diterima. Besar Pengaruh Model Problem Based Learning Berbantuan Canva Terhadap Pemahamn Konsep Belajar Fisika Di SMAN 7 Kota Bengkulu yang dihitung dengan rumus Effect Size didapatkan pengaruh sebesar 3,12, artinya pengaruh yang diberikan sangat tinggi.*

***Kata kunci:*** *pemahaman konsep, problem based learning, effect size.*

## ▪ INTRODUCTION

The development of the world of education is closely related to science and technology. Science and technology change and develop rapidly and advance every day. This is a problem related to modern education. Understanding the characteristics of each generation is important in determining what teaching methods and strategies are effective. Teachers need to take a different perspective on how to integrate physical and digital aspects in the way students communicate, behave and learn. This determines the teaching methods and models that the teacher will use in the learning process. In the 2014/2015 academic year, the 2013 Curriculum, which is an updated and refined version of the 2006

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Curriculum, began to be implemented throughout Indonesia. The basic characteristic of the 2013 curriculum is the concept of curriculum development. The 2013 curriculum emphasizes a scientific approach at primary and secondary school levels (Setiadi, 2016).

Physics is a subject that is considered difficult by many students at school. Physics lessons are subjects that contain a collection of material that contains abstract principles and theories, so it is difficult for students to understand them. Not only does it come in the form of material that contains formulas or equations, but there are many concepts that we must understand well in detail and can use in everyday life. The current learning process is unable to improve students' ability to understand concepts. This is because students have not been able to build their knowledge. Students often rely on teachers as a source of knowledge, and there are still teachers who treat students as learning objects, not as individuals whose potential needs to be developed. As a result, students often do not understand the concepts taught by teachers. Students only remember one correct answer and do not have the ability to look for other alternative answers to problems. Students are still unable to think deeply and concentrate on the material being studied, which hinders students from connecting one concept with another.

In the physics learning process, students' understanding of concepts is greatly influenced by the quality of the learning model used by the teacher, because the quality of a learning model is one of the factors that determines students' learning outcomes in understanding the concepts of the material being taught (Liana et al., 2023) . In everyday life, students must be able to explore their understanding and skills to solve problems in everyday life. Therefore, teachers should continuously assess students' thinking abilities, remembering that critical thinking is very necessary in the students' learning process. Therefore, learning is not just memorizing facts and concepts, but also discovering these facts and concepts by developing thinking skills and the ability to understand concepts (Rahmadani, 2019). The ability to understand concepts has a similar meaning to the ability to express and apply material that has been presented in language that is easy to understand and precise (Kertinus et al., 2019).

Hamzah, et al in their research stated that understanding is the human ability to understand, interpret, translate or quote something in their own way regarding the knowledge they have discovered or learned. Understanding concepts is usually defined as the ability to understand concepts and explain material well. Understanding concepts is one part of learning outcomes that can be measured, so it can be concluded that aspects of understanding can influence student learning outcomes (Lismah et al., 2017). Understanding physics concepts is the ability to interpret, explain and generalize the physics material studied so that students can themselves understand the material being taught, and are able to interpret the meaning explained when the physics learning process occurs (Shidik, 2020). Understanding concepts is a process where students discover, master and understand information obtained through thinking and acting in understanding each concept of an object (Safarati & Rahman, 2020).

The low ability of students to understand concepts is caused by several factors. One of them is that the learning process in class always uses direct learning, because in the learning process teachers tend to convey information only using the lecture method, and do not use a learning model where the teacher explains the material then asks examples of questions for students to work on that are related to the material being taught. The lecture method is not always effective and has several weaknesses in the learning process.

These weaknesses include students feeling bored, forgetting quickly, having difficulty knowing whether individuals understand something or not, and lack of motivation to participate in activities in the learning process (Lismah et al., 2017).

The teaching and learning process is the most important part of the educational process. There are many things that teachers must consider when choosing models and methods that will be used in class to improve students' ability to understand concepts in the material being taught. Models and methods must be selected and adapted to the research subject. Students in high school usually have low and simple thinking abilities, so they need guidance to improve their thinking abilities gradually. The Problem Based Learning model is suitable for improving students' ability to understand concepts.

Kunandar said that Problem Based Learning is a learning approach that uses real problems as a context for students to master and be skilled at critical thinking and gain knowledge through important concepts (Burhana et al., 2021). Arends states that the problem-based learning model is a learning process in which students solve real world problems to develop their own skills, develop curiosity and high-level thinking skills, and can develop independence and self-confidence in students (Mayasari et al., 2022 ). Abdullah and Ridwan in their research stated that the Problem Based Learning Model can improve student learning outcomes from the cognitive, affective and psychomotor perspectives of students (Nafiah & Suyanto, 2014). The Problem Based Learning Model is a learning model that focuses on problems that are easy to identify. This PBL model is also useful as a means of motivating students and encouraging students to actively participate in the learning process (Greening, 2016).

Problem-based learning (PBL) is a learning model that can integrate various learning topics with experience (Rillero & Chen, 2019). PBL is a learning model that suits the needs of the 21st century, this model can improve critical analysis skills and teamwork (Vasquez & Lara, 2020). The problem based learning model is a model that forces students to be more active in developing critical, creative, systematic thinking skills and the ability to understand concepts and solve problems which can improve learning outcomes (Faqiroh, 2020).

The problem-based learning (PBL) model is a model that utilizes problems that exist in the real world. Problems are set as the starting point of the learning process which motivates students to continue investigating so they can better understand the problem and its solution (Dwi Anggriani & Eko Atmojo, 2022). The main goal of the PBL model is not only to develop students' knowledge, but also to develop critical thinking and problem solving abilities as well as students' own ability to actively develop their own knowledge. PBL also aims to increase students' academic independence and social skills. Academic autonomy and life skills can be grown when students work together to find the right knowledge, strategies and learning materials to solve problems (Mayasari et al., 2022).

According to Ariana, there are several steps or syntax for the problem-based learning model. The steps or syntax of this problem-based learning model are called phases. The first phase is student orientation to the problem. In this first phase, the teacher presents the problem that the group wants to solve. The questions asked must be contextual. Students can find their own problems by using reading materials or activity sheets. The second phase is organizing students to learn. In this phase the teacher ensures that each student understands their assignment. Students discuss and distribute tasks to

search for data or literature needed to solve the problem. The third phase is to guide individual and group investigations. In this phase the teacher observes student participation in collecting data or materials during the investigation process while students carry out investigations looking for data or sources that are appropriate to the topic to be discussed. The fourth phase is developing and presenting the results of the work. In this phase the teacher monitors the discussion and guides the preparation of the report so that the results of each group's work are ready to be presented. The group discusses solutions to problem solving and the results are presented in the form of work. The final phase is the phase of analyzing and evaluating the problem solving process. In this phase the teacher guides the presentation and invites other groups to provide input to other groups, then students can draw conclusions from the input provided by other groups (Zainal, 2022).

Canva is a software that can help make product development more fun. Canva is an online design tool that works on desktop, Android, or laptop. Canva offers a variety of designs for presentations, resumes, posters, flyers, brochures, graphics, information fonts, banners, flyers, certificates, diplomas, invitations, YouTube thumbnails and more (Tanjung & Faiza, 2019). Based on the results of interviews with physics subject teachers at SMAN 7, Bengkulu City, information was obtained that there was some physics material that was very difficult for students to understand. Students look confused when asked to explain the material they have studied again, because students do not pay attention to the explanation given and do not master the concept of the material. This is certainly a tough challenge for the teacher. This is the reason researchers are interested in finding solutions that can correct errors that result in low ability to understand physics concepts.

Based on the results of observations at SMAN 7 Bengkulu City, learning activities often use lecture, practicum and presentation methods only where the delivery only focuses on the teacher and the teacher does not use interesting learning media, so that students do not have interest in paying attention to the teacher's explanations. This makes students have a less than optimal understanding of the concepts in each learning material. The subject teacher stated that one of the concepts that students still cannot understand optimally is the concept of static fluid material. From the problems above, a learning model and media are needed that can improve students' ability to understand physics learning concepts. So as to create an active, creative, interesting learning process and able to achieve learning objectives. Therefore, researchers are interested in conducting research with the title The Influence of the Canva-Assisted Problem Based Learning Model on Understanding Physics Learning Concepts at SMAN 7 Bengkulu City. The purpose of this research is: a) To find out and describe the influence of the Problem Based Learning model assisted by Canva on understanding the concept of learning physics at SMAN 7 Bengkulu City. b) To find out and describe how much influence the Problem Based Learning model assisted by Canva has on understanding physics learning concepts at SMAN 7 Bengkulu City.

## ▪ METHOD

### Subject, Place and Time of Research

This research was carried out in the odd semester of the 2023/2024 academic year

at SMA Negeri 7 Bengkulu City. The population in this study were all class XI students of SMAN 7 Bengkulu City who were distributed in 8 classes. The sampling technique in this research is purposive sampling, namely the sampling method is based on the researcher's considerations and directions from the relevant subject teachers regarding deciding which samples are most instrumental and representative (Retnawati, 2020). Based on the results of the teacher's recommendations for related subjects, XI IPA 3 consisting of 37 students was selected as the experimental class and XI IPA 5 consisting of 36 students was the control class.

**Variables and Research Design**

This research is a quasi-experimental research consisting of two variables, namely the independent variable and the dependent variable. The independent variable (X) is the variable that causes changes to the dependent variable (Y) in this research, namely the Problem Based Learning (PBL) Model. Meanwhile, the dependent variable (Y) is the variable that is influenced or changed due to the independent variable (X) in this research, namely the ability to understand concepts through E-LKPD assisted by Canva. The design form used in this research is Nonequivalent control group design (Hunter et al., 2018)

**Instrumens**

The data in this research is quantitative data on understanding the concept of physics learning outcomes in the form of pretest scores, posttest scores and effect size. The procedures carried out in this study are divided into 4 stages, namely the preparation stage, planning stage, implementation stage and finally the results. The data collection techniques in this research are observation, tests, interviews and documentation.

In this research, the instrument used was a concept understanding test in the form of a description test. The description test used in this research instrument contains 3 indicators of concept understanding based on the opinion of Benyamin S. Bloom (Jarmita et al., 2019), namely: 1. Translation, 2. Interpretation, and 3. Extrapolation. The test instrument to measure the level of understanding of the concepts that will be used for data collection will be assessed first by three experts consisting of two lecturers and one physics teacher. This aims to determine the validity of the content determined using an expert judgment sheet. The total pretest and posttest question instruments that will be made are 10 essay questions. Questions that have been assessed by 3 experts will then be corrected with the help of a supervisor if there are questions that are not quite right. The revised questions will then be tested on students who have studied static fluid material, namely class XII. The results of this trial will be used to determine the validity of the questions, the reliability of the questions, the level of difficulty of the questions and the differentiating power of the questions. The test score for the validity of the questions using product moment correlation calculations ranges from 0.387 – 0.877, which means that the questions are valid questions. The reliability score for the questions is 0.668, which has high criteria. The score for the difficulty level of the questions ranges from 0.16 – 0.92, consisting of 1 difficult question, 5 questions with a medium level of difficulty, and 4 questions with an easy level of difficulty.

The results of the analysis of the calculation of the concept understanding test instrument show that the test instrument is declared valid, meets the requirements for a reliable test, in accordance with the requirements for the level of difficulty of the items and the differentiating power of the specified question items, so that this concept

understanding test instrument is declared suitable for use as a data collection technique. .

**Data Analysis**

The data obtained is quantitative data from the pretest and posttest results of the experimental class and control class. Next, provide answer scores for students according to the alternative answers and scoring system used, so that pretest and posttest scores for both classes are obtained. Make a table of pretest and posttest scores for each class. Then calculate the average value and standard deviation of the pretest and posttest scores for both classes using Excel. Next, carry out a homogeneity test to determine the normality of the pretest and posttest data using the Liliefors test in Excel. Carry out a homogeneity of variance test using Excel to determine whether the variances of the experimental and control groups are the same or different. After fulfilling the normal and homogeneous requirements, a test of the difference in the average pretest score and a test of the difference in the average posttest score were carried out using the t-test, namely the Independent Sample T-Test. If the data meets the requirements of normality and is not homogeneous, then it is carried out using the t'-test. Furthermore, if the data does not meet normal requirements, then a non-parametric test is carried out for two independent samples, using the Mann-Whitney Test. Then, if the results are obtained that the Problem Based Learning model assisted by Canva has an influence on increasing students' ability to understand physics concepts, then the next step will be to look for the size of the effect (effect size). In this research, the effect size test used is Cohen's d effect size. The size of the effect or influence of a variable on another variable, the results of calculating Cohen's Effect Size value are interpreted using Cohen's criteria in table 1.

**Table 1.** Interpretation of the effect size test

| Interval | Interpretation |
|---|---|
| 0 – 0.20 | Very low |
| 0.21 – 0.50 | Low |
| 0.51 – 1.00 | Moderate |
| > 1.00 | Very high |

## ▪ RESULT AND DISSCUSSION

This research began by providing an initial assessment in the form of a pretest with 10 essay questions for the experimental class and control class. After giving the pretest to both classes, the next step is treatment for both classes. In the experimental class it is taught using the Problem Based Learning Model, while in the control class it is taught using the direct learning model. After carrying out the treatment for the two classes, the experimental class and control class were given a final test in the form of a posttest with 10 essay questions. After carrying out the pretest, treatment and posttest for the two classes, the next step was to calculate the average and standard deviation for the two classes to see the increase in competency that occurred before and after learning which is presented in table 2.

**Table 2.** Average score and standard deviation of pretest and posttest for experimental class and control class

| Groups | Pretest | | Posttest | |
|---|---|---|---|---|
| | $\bar{x}$ | s | $\bar{x}$ | s |

| | | | | |
|---|---|---|---|---|
| Control | 46.07 | 21.57 | 46.29 | 15.96 |
| Experiment | 65.60 | 13.73 | 86.06 | 9.90 |

The results of the analysis of the average score and standard deviation of the experimental class and control class show very significant differences. This difference in average scores shows an increase in competence before and after learning in both classes. The control class showed an increase of 0.22. Meanwhile, the experimental class showed an increase of 20.45. In this case it can be seen that after being given treatment to each class, the experimental class using the Problem Based Learning model was superior in increasing understanding of physics concepts compared to the control class which used the direct learning model.

After calculating the average score and standard deviation of the experimental class and control class, the normality test was then calculated to determine whether the data taken was within the normal distribution using the Liliefors Test (Usmadi, 2020). To determine that the data is in a normal distribution by comparing Lcount with Ltable. If Lcount < Ltable then the data is normally distributed. Conversely, if Lcount > Ltable then the data has an abnormal distribution. Based on the results of normality testing using the Liliefors test presented, it was found that in the control class the pretest L count score (0.10) < L table (0.17) meaning that the control class pretest score was distributed normally. For the control class posttest Lcount score (0.11) < Ltable (0.17), this means that the control class posttest score is normally distributed. Meanwhile, for the experimental class scores, it was found that the pretest Lcount score (0.09) < Ltable (0.17), meaning that the control class pretest scores were distributed normally. For the experimental class posttest Lcount score (0.14) < Ltable (0.17), this means that the control class posttest score is normally distributed.

Based on the analysis of the results of the normality test using the Liliefors test, it was found that the data on students' understanding of physics learning concepts in the experimental class showed that the pretest data and posttest data for both classes were normally distributed. Next, a homogeneity of variance test was carried out. The homogeneity of variance test is carried out to analyze data that compares two or more groups of data. The homogeneity test used in this research is the Harley test. The basis for decision making is if Fcount < Ftable with a significance level of 0.05 then the group has a homogeneous variance. On the other hand, if Fcount > Ftable with a significance level of 0.05 then the group has a non-homogeneous variance (Usmadi, 2020). The results of the homogeneity of variance test using the Harley test obtained were the posttest data for each class, obtained calculated F (0.15) > F table (1.90), so the posttest data for each class was homogeneous. Based on the results of the normality test and variance homogeneity test, it was found that the data was normally and homogeneously distributed, so a hypothesis test was carried out using the T-test, namely the Independent Sample T-Test from posttest data from the experimental class and control class (Sulestiyono, 2020). The results of hypothesis testing using the Independent Sample T-Test are presented in table 3.

**Table 3.** Hypothesis test results using the independent sample T-Test

| | | Levene's Test | | T-Test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Significance Two-Sided p | Mean Difference | Std. Error Difference | 95% Confidence Interval of The Difference Lower | Upper |
| Postest score | Equal Variances Assumed | 7.501 | .008 | -11.478 | 52 | <.001 | -39.815 | 3.468 | -46.775 | -32.854 |

The results of hypothesis testing using the Independent Sample T-Test show that there is an influence of the independent variable (X) on the dependent variable (Y), the value obtained with the help of the IBM SPSS for Windows application has a significance value (Asymp. Sig. (2-tailed) of < 0.001. Based on these results, the Asymp Sig (2-tailed) < 0.05 so that Ho is rejected and Ha is accepted, meaning that there is an influence of the Problem Based Learning model assisted by Canva on the understanding of physics learning concepts at SMAN 7 Bengkulu City. After carrying out the pretest and posttest on the experimental class and control class, the next step is to calculate the N-gain value for each test instrument indicator for the concept understanding test. The test instrument in this study consisted of 10 descriptive questions for the pretest and posttest. The N-Gain results for the value of each indicator are presented in Figure 1.

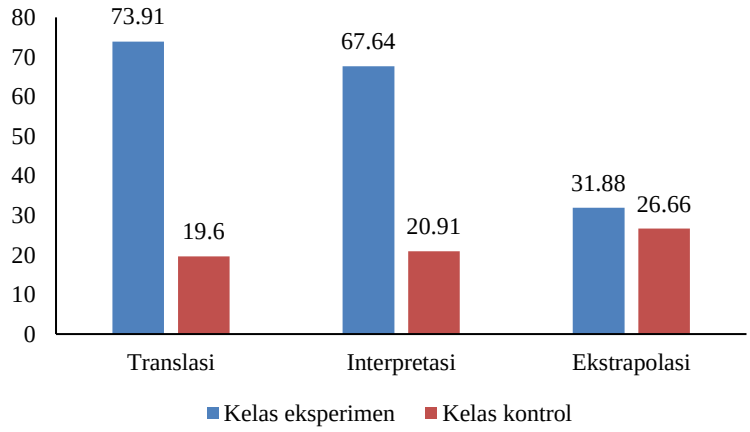


**Figure 1.** N-gain score pretest and posttest for the experimental class and control class

Figure 1 shows that there are 3 indicators of concept understanding, namely, translation, interpretation and extrapolation. The average N-gain score for each indicator of conceptual understanding in the experimental class and control class shows a very significant difference. In the experimental class taught using the Problem Based Learning model, the N-gain score was 73.91 for the indicator of understanding the concept of translation, while the N-gain score for the indicator of understanding the concept of

interpretation was 67.64 and the N-gain score for the indicator of understanding the concept of extrapolation was 67.64. 31.88. The control class taught using the direct learning model had an N-gain score of 19.6 for the indicator of understanding the concept of translation, while the N-gain score for the indicator of understanding the concept of interpretation was 20.91 and the N-gain score for the indicator of understanding the concept of extrapolation was 26. .66. The N-gain score from the indicator of understanding the concept of translation in the experimental class and control class shows a difference of 56.31. The N-gain score for the indicator of understanding the concept of interpretation shows a difference of 46.73. Meanwhile, the N-gain score for the indicator of understanding the concept of extrapolation shows a difference of 5.22. From the results of the N-gain score analysis for the concept understanding indicator, it shows that the experimental class using the Problem Based Learning model is superior in increasing understanding of physics learning concepts compared to the control class using the direct learning model. It can be interpreted that in this research the experimental class using the Problem Based Learning model was successful in increasing understanding of physics learning concepts. The results of this research are in line with research conducted by (Manalu, 2022) which stated that students' ability to understand physics concepts taught using the direct learning model to the Problem Based Learning model increased from 41.72 to 70.98.

Mastering the understanding of physics learning concepts really helps students in solving problems and implementing previously taught material in real life. This is in accordance with the meaning of conceptual understanding, which means students can explain the concepts taught by the teacher again, students can look for alternative problem solutions to existing problems and students are able to apply the concepts taught in the real world. However, there are several problems that hinder students' ability to understand concepts. The main problem factor found by researchers in improving students' ability to understand physics learning concepts is that in the learning process the direct learning model is still applied.

After obtaining the results from the hypothesis test, the next thing to look for is how big the effect size is using the effect size test. This effect size test is a test to measure how large the scale of influence of the Problem Based Learning model assisted by Canva is on the understanding of physics learning concepts at SMAN 7 Bengkulu City. The result of the calculation for the Cohen's Effect Size Test is 3.12, which shows that the influence of the Problem Based Learning model assisted by Canva on the understanding of physics learning concepts at SMAN 7, Bengkulu City has a very high influence. Based on the results of the analysis in this research, it was found that the experimental class which used learning with the Problem Based Learning model assisted by Canva had a better effect on increasing understanding of physics learning concepts compared to the control class which used the direct learning model.

The results of this research show that the Problem Based Learning model assisted by Canva is very influential in improving students' ability to understand concepts. The experimental class taught using the problem based learning model was far superior in improving the ability to understand physics learning concepts compared to the control class taught using the direct learning model. The problem based learning model has proven to be efficient for use in school learning, especially for physics subjects. This is reinforced by several previous research results regarding the Problem Based Learning

model and students' understanding of physics learning concepts. Based on the results of research conducted by (Aristawati et al., 2018), descriptively, the group of students who took part in learning using the Problem Based Learning model had a higher understanding of learning concepts compared to the group of students who took part in learning with the direct learning model, because the learning model was problem based. requires students to learn more actively to solve the problems that have been provided, find out their own knowledge so that students are motivated to compete with their peers. This problem-based learning model can also minimize student boredom in the learning process because students are given the opportunity to regulate the strategies used in their learning themselves.

In his research, a respondent stated that learning using the Problem Based Learning (PBL) model can improve student learning achievement results starting from the highest of 96% to the lowest of 5% with an average of 43.6%. The average achievement of student learning outcomes before treatment was 57.14% and after treatment with the Problem Based Learning model there was an increase to 79.09% (Robiyanto, 2021). A researcher in their research explained the results of research that the conceptual understanding of students who were taught using PBL assisted by video based laboratory had an average score of 69.28 while students who were not taught using the PBL model assisted by video based learning was 57.12. This shows that there is an average difference between the two classes. Classes that are taught using the PBL model assisted by video based learning have higher scores than classes that are not taught using the PBL model assisted by video based learning, so it can be concluded that the PBL model has a positive influence on students' understanding of concepts (Saharsa et al., 2018 ).

Based on the results of the learning process carried out for the two classes with different models, there are significant differences in the learning process steps carried out in the experimental class and the control class. In the experimental class, each meeting held in the learning process is divided into 5 phases according to the syntax of the Problem Based Learning model. The first phase is the orientation of students to problems, in this phase the teacher provides information about the problems that will be solved by students later and students have an obligation to observe and understand the problems that have been presented by the teacher. The second phase is organizing students. In this second phase the teacher divides students into several small groups to discuss and answer the E-LKPD that has been distributed. The third phase is guiding individual and group investigations. In this third phase the teacher guides students to carry out experiments that have been provided in the E-LKPD and encourages each student in the group to discuss the results of the experiments that have been carried out. Next is the fourth phase, namely developing and presenting the results, in this phase the teacher monitors the progress of the group discussion and guides the preparation of students' reports on the HVS for each group to be presented, while students conduct group discussions to solve problems and problems in the E-LKPD that has been presented by teacher and present the results of the group discussion in front of the class. The final phase is analyzing and evaluating the problem solving process. In this fifth phase, the teacher guides the presentation carried out by each group and gives awards or input to groups that have presented the results of the discussion, while the student activity is for each individual in the group to make a presentation to the class and receive appreciation from the group or teacher. The next activity is for the teacher together with the students to draw conclusions or summarize the

learning process that has been carried out in one meeting. Meanwhile, in the control class which applies learning using a direct learning model, the teaching and learning process is still dominated by the teacher. The role of students is to listen to master the material taught by the teacher. When the learning process is carried out, students still appear passive and not interested in participating in the learning process. So it can be concluded that the experimental class which conducts learning using the Problem Based Learning model is more active and the learning is more effectively implemented compared to the control class where the learning process is still watched or dominated by the teacher alone.

Carrying out research in the experimental class shows that students are more active in the learning process, such as asking questions, answering questions asked, looking for information about the problem being discussed from reading books or other references, and students are seen actively discussing and presenting the results of the discussion to the class. so that the teaching and learning process is more effective and students are motivated to learn independently in developing their knowledge.

## ▪ CONCLUSION

Based on the results of the research and data analysis that has been carried out, conclusions can be drawn from hypothesis testing using the Independent Sample T-Test that there is an influence of the Problem Based Learning model on understanding the concept of learning physics at SMAN 7 Bengkulu City. Based on the N-Gain test for indicators of understanding the concept of the Problem Based Learning model, it has proven successful in increasing students' understanding of learning concepts. In the effect size test, the results obtained were that the Problem Based Learning Model had an influence of 3.12 with very high criteria, so it can be seen that the influence of the Problem Based Learning model assisted by Canva on understanding the concept of learning physics at SMAN 7 Bengkulu City was included in the very high criteria. The learning process carried out in the experimental class with the Problem Based Learning model assisted by Canva showed greater activeness compared to the control class with the direct learning model.

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