# THE INFLUENCE OF PROBLEM BASED LEARNING MODELS HELPED BY INSHOT VIDEO LEARNING MEDIA ON ENERGY LITERACY ABILITY LEARNERS

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## ABSTRACT

This study aims to 1) Describe the Energy Literacy Skills of students using the Problem Based Learning learning model. 2) Describe the Energy Literacy Skills of students using the Problem Based Learning learning model without the help of inshot videos. 3) Describe the influence of the Problem Based Learning model assisted by inshot videos on the energy literacy skills of class X students. This type of research is a quasi-experiment (pseudo-experiment). The design of this study is Non-equivalent Control Group Design. The population of this study was all class X students of SMA Negeri 29 Bone in the even semester of the 2024/2025 academic year. The sample of this study was class X E1 consisting of 20 people as the experimental class and class X E2 consisting of 20 people as the control class. The data collection method was carried out using the test method, namely the test instrument (description). The data obtained were analyzed using descriptive analysis techniques and inferential analysis, namely hypothesis testing. The results of this study indicate that: 1) The Energy Literacy Ability Level of Class 2) The Energy Literacy Ability Level of Class 3) There is a significant influence of the Problem Based Learning learning model assisted by video inshot learning media on the Energy Literacy Ability of students in the experimental class with a hypothesis test coefficient value of 0.001 <0.05.

**Keyword**: Inshot Video Learning Media, Literacy Skills, Problem Based Learning Assisted, Students' Energy

## INTRODUCTION

Education is crucial for nation building. High-tech education will produce qualified, superior, and enthusiastic individuals, possessing the skills to meet the challenges of future national development. Government Regulation of the Republic of Indonesia No. 57 of 2021 concerning National Education Standards, Article 1, explains that education is a planned initial step to create a fun and interactive learning environment to develop students' abilities. One way to achieve enjoyable learning is by using appropriate learning media.

In the 21st century, students are given the opportunity to develop four competencies during the learning process: spirituality, attitudes, knowledge, and skills. Teachers in the 21st century play a crucial role in improving the quality of education in Indonesia as expected. Teachers can implement new innovations by implementing media and learning models in the classroom to ensure optimal learning and achieve learning objectives. Teachers are required to apply media and models tailored to the characteristics and needs of their students.(Fiina Nur Hayati et al., 2024)

Learning models are closely related to the methods and effects of physics instruction. To date, physics research in schools has tended to be dominated by a teacher-centered model. This model tends to be unbalanced, with students predominantly receiving and listening to the teacher's presentation. Essentially, education is also about setting an example, fostering character, and developing students' potential.(Socrates & Mufit, 2022)

The use of problem-based learning models certainly requires engaging learning media. There are many types of engaging digital media, including: video media created with in-shot applications, digital learning games, videos, YouTube, PowerPoint, educational websites, educational TV, and educational applications such as Ruang Guru, Sekolah, and Kelas Pintar. The use of engaging educational media increases students' interest in focusing on their learning and, furthermore, the presence of educational media stimulates students' thinking when understanding the material.(Fiina Nur Hayati et al., 2024)

The problem-based learning model means that the learning model involves students in solving real-life problems.(Yandhari et al., 2019). Problem-Based Learning (PBL) is a form of learning that focuses on the learning process by developing skills and problem solving.(Sonia, 2024)

Problem-based learning (PBL) is a problem-based learning system that encourages students to work together in groups, collaborate to find solutions, think critically and analyze, and use relevant and accountable learning resources.(Puspitasari et al., 2023)

Learning can be implemented not only using traditional media but also other technology-based media. This is a necessity that must be implemented in today's learning environment. The use of video in learning can also be an alternative medium. Video media is very effective and

efficient, can increase student motivation in the learning process and help achieve learning objectives.

These media also allow students to explore the material they are learning, enabling them to become more active learners in the learning process, making the material more memorable, effective, and beneficial for subsequent learning success. With the advancement and development of information technology, media consumption needs are also changing. Educators must act professionally and be able to present technology-based learning media in a modern, engaging, high-quality, and practical way. There are many types of learning media that educators can use to support the teaching profession, including media that utilizes video.(Marni et al., 2023)

Teachers can utilize the InShot app to create creative instructional videos to adapt the traditional learning process to increasingly sophisticated technological developments, preventing students from getting bored easily. For example, teachers can create instructional media in the form of videos that can be created using only a device and an Android-based application, namely the InShot app. Not only can teachers create learning media using the InShot app, but students can also use InShot if they are assigned by the teacher to create a simple video. Because the InShot app is very easy to use even for beginners, this way teachers can increase their creativity by creating creative instructional videos.(Mulyani, 2023)

According to(Nisa, 2022)The InShot app is an easy-to-use application for creating learning media. It's a simple and popular video editing app. It's free and can be installed on all smartphones, both Android and iPhone. The InShot app's advantages in creating learning media include image insertion, video insertion, background functions, text animation, image animation, adding stickers, music, sound, video cutting, and video control with filter speed and adjustments. It's also easy to use because it doesn't require an internet connection.

In this modern era, energy plays a vital role in human life. From lighting the lights at home, powering vehicles, to running industries, energy is key to progress and prosperity. However, unwise use of energy can have negative impacts on the environment and the sustainability of life on earth. Therefore, energy literacy for students is crucial so that students can understand and understand what energy literacy is. Energy literacy helps students develop a deeper understanding of science, technology, and their roles in society and the world. Energy literacy is defined as an

understanding of the nature and role of energy in the world and our daily lives, accompanied by the ability to answer questions and solve problems (US Department of Energy, 2012). A frequently encountered problem is low student learning outcomes accompanied by decreased student activity. This is due to students' poor understanding of what is being taught. Based on the problems encountered in physics learning in high school, it is necessary to find solutions that can overcome these problems. Therefore, to achieve learning objectives, it is necessary to apply an appropriate learning model, which is expected to overcome all problems in physics learning, including improving students' energy literacy skills.(Maknuniyah et al., 2019)

Literacy is a very important skill for students to master appropriately in the era of disruption, because it is the most important skill to face the peak of the digital transformation wave in the 21st century.(Harahap et al., 2022)According to the US Department of Energy (2012), energy literacy is defined as an understanding of the nature and role of energy in the world and our daily lives accompanied by the ability to apply this understanding to answer questions and solve problems.

According to(Yusup, 2017)Energy literacy can be imparted through education. The curriculum plays a crucial role in teaching energy literacy to students. Adequate energy literacy instruction is essential for a quality education.

Based on an interview with one of the physics teachers at SMAN 29 Bone, it was stated that one of the problems experienced by students is in the aspect of problem solving. This is seen when students work on physics problems, students immediately use mathematical equations without analyzing, guessing the formula used and plagiarizing example problems. In addition, students in the process of guessing answers or hypotheses are still less logical when faced with physics problems. Meanwhile, the use of learning media in learning is still considered less varied, experiencing difficulties in absorbing lessons and technological developments make students play more with mobile phones. This is characterized by students' behavior who are less enthusiastic in participating in learning due to feeling bored and sleepy, so less active in the learning process. This results in student learning outcomes are less satisfactory. Therefore, in the learning process, innovative learning models and learning methods are needed to support this.

Based on the description above, it can be concluded that efforts to overcome the above problems require learning models and methods that can help resolve issues in students' energy literacy. One learning model that can address these issues is using a problem-based learning model assisted by inshot video media. The innovation of problem-based learning models with media is a combination that greatly supports the learning process in schools. Moreover, the current state of education accompanied by technological developments in the field of education cannot be denied that the world of education must adapt to existing technological developments. Types of interactive learning methods such as inshot video learning media are good media collaborated with the application of learning models.

The objectives of this study are 1) To describe the Energy Literacy Skills of students using the Problem Based Learning learning model. 2) To describe the Energy Literacy Skills of students using the Problem Based Learning learning model without the help of Inshot videos. 3) To describe the influence of the Problem Based Learning learning model assisted by Inshot videos on the energy literacy skills of class X students.

## METHOD

This research is a quasi-experimental research type (quasi-experiment) with a Non-equivalent Control Group Design. This design was chosen becauseNeither the experimental nor the control group in this design is randomly selected. The Nonequivalent Control Group Design is as follows:

**Table 1.**

**Experimental research design**

| | | |
|---|---|---|
| O1 | X | O2 |
| O3 | | O4 |

Source:(Sugiyono, 2013)

Information:

O1 = Score*Pretest*experimental group

O2 = Score*Posttest*experimental group

O3 = Score*pretest*control group

O4 = Score*Posttest*control group

X = Treatment with the Problem Based Learning model assisted by inshot video learning media

This study used two classes: an experimental class and a control class. This design provided a pre-test to determine the initial conditions between the control and experimental classes. This study was conducted at SMA Negeri 29 Bone in the even semester of the 2024/2025 academic year, with the study population being grade 10 students.

The sample in this study was determined by purposive sampling technique where the sample was taken with a specific purpose or objective. So the sample of this study was taken from class X E1 as an experimental class that uses the Problem Based Learning learning model assisted by inshot video learning media and class X E2 as a control class using a conventional model. The research variables used in this study are the independent variable is the Problem Based Learning learning model assisted by inshot video learning media applied to the experimental class and the dependent variable is the students' energy literacy abilities.

The instrument was a test of students' energy literacy abilities. The pretest consisted of 10 descriptive questions, as did the posttest, which also consisted of 10 questions. These questions were validated by two physics education validators. The instrument was then tested on students, not samples. The validity test using Product Moment resulted in 8 questions being declared valid. A reliability test yielded a reliability coefficient (α) of 0.901, categorized as very high. Therefore, the instrument is worthy of research. The difficulty level was then tested to identify whether the questions were good. The discriminatory power of a question is the ability of a question to differentiate between students who are intelligent (who have mastered the material) and students who are less intelligent (who have not mastered the material). $r_{11}$

Data analysis used descriptive analysis and inferential analysis consisting of normality tests, homogeneity tests and hypothesis tests.

## RESULTS

This study used an experimental class and a control class. The experimental class used a Problem-Based Learning model assisted by inshot video learning media, while the control class used a conventional learning model. Before using the pretest questions, a pretest trial was conducted on grade X students of SMA Negeri 29 Bone with 10 essay questions. The pretest trial aimed to determine the level of validation, reliability, difficulty level, and discriminating power.

The results of the validity test were carried out on 10 questions given to class X students of SMA Negeri 29 Bone, resulting in 8 valid questions and 2 dropped questions, 8 questions that will be used for the pretest and posttest.Based on the reliability test of the test instrument, the instrument reliability value was 0.901 with very high criteria. The results of the difficulty index analysis of the Energy Literacy Ability test instrument show that all questions are categorized as difficult. The discriminating power of the questions on the Energy Literacy Ability test instrument in this study is that all questions are categorized as sufficient.

### Descriptive Analysis

The descriptive analysis in this study was divided into two classes, namely the experimental class and the control class. Data collection for each class was carried out using*pretest*And*posttest.*The results of statistical data on the Energy Literacy Abilities of class X students at SMA Negeri 29 Bone can be seen in table 1.1 below.

**Table 2**

**Descriptive analysis of pretest**

| Category | Class | |
|---|---|---|
| | Experiment | Control |
| Number of samples | 20 | 20 |
| Average value | 20.45 | 19.75 |
| Standard deviation | 11.78 | 6.44 |
| The highest score | 42 | 35 |

| | | |
|---|---|---|
| Lowest value | 6 | 6 |
| Ideal value | 100 | 100 |

Based on table 2, the descriptive statistical analysis values for the data are obtained.*pretest*Energy Literacy Skills of Class X students of SMA Negeri 29 Bone. In the experimental class, namely Class X E1, which participated in*pretest*As many as 20 students obtained an average score of 20.45 with the highest score being 41 and the students who obtained the lowest score were 6 people from the ideal score of 100. Meanwhile, the standard deviation in the experimental class was 11.78.

Meanwhile, for the control class in class X E2, the results of descriptive statistical analysis were obtained, which was followed by 20 students, obtaining an average score of 19.75 with the highest score achieved by students being 35 and students obtaining the lowest score of 6 from the ideal score of 100. Meanwhile, the standard deviation in the control class was 6.44. The difference in standard deviation can be used to determine the distribution of data and show how close the data is to the mean value.

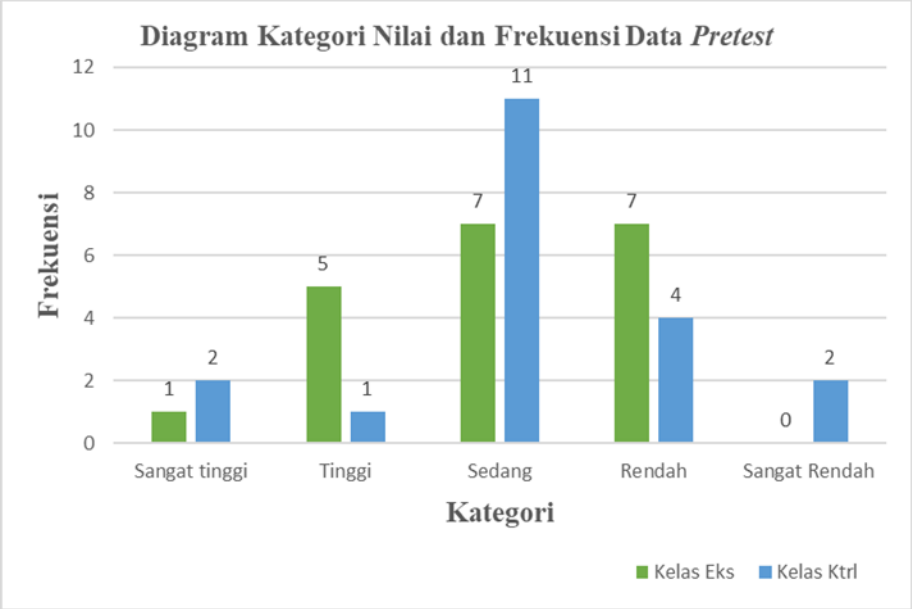


Figure 1.Value and Frequency Categorization Diagram (*(Pretest)*

Based on Figure 1, the level of energy literacy ability of class X students of SMA Negeri 29 Bone between the experimental class and the control class can be described. The very high category is dominated by students in the control class compared to the experimental class. Meanwhile, the high category is dominated by students in the experimental class compared to the control class. Meanwhile, the medium category is more dominated by the control class than the experimental class. Furthermore, the low category is more dominated by the experimental class than the control class and the very low category is only filled by students in the control class.

**Table 3**

**Descriptive analysis *posttest***

| Category | Class | |
|---|---|---|
| | Experiment | Control |
| Number of samples | 20 | 20 |
| Average value | 61.1 | 46.5 |
| Standard deviation | 9.11 | 7.63 |
| The highest score | 77 | 65 |
| Lowest value | 42 | 36 |
| Ideal value | 100 | 100 |

Based on table 3, the descriptive analysis value of the posttest data on Energy Literacy Ability in class X of SMA Negeri 29 Bone is obtained. In the experimental class, namely class X E1, which took the posttest as many as 20 students obtained an increase from the pretest data, namely an average of 61.1 with the highest value obtained by students being 77 and the lowest value being 42, while the standard deviation was 9.11.

Meanwhile, in the control class, namely class X E2, using the conventional learning model, the average score obtained was 46.5 with the highest score being 65 and the lowest score obtained being 36, while the standard deviation in the Energy Literacy Ability posttest was 7.63.

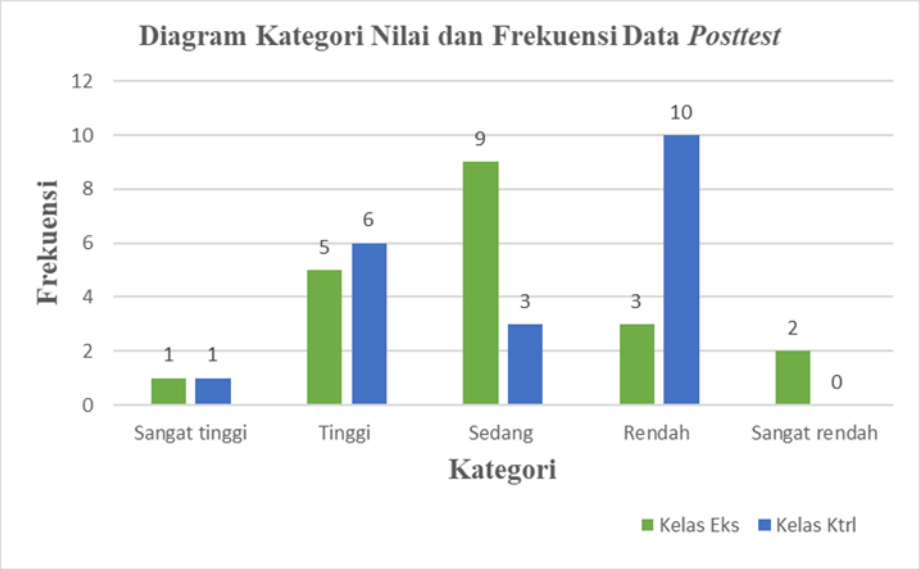


Figure 2 Value and frequency categorization diagram (posttest)

Based on Figure 2, it can be seen the description of the posttest data of Energy Literacy Ability of class X students of SMA Negeri 29 Bone which shows the categorization of the level of Energy Literacy Ability of students after being given the problem based learning model treatment assisted by inshot video learning media in the experimental class and the conventional learning model in the control class. The very high category has the same value by students in the control class and the experimental class. While in the high category it is dominated by students in the Control class compared to the experimental class. While the medium category is more dominated by the experimental class than the control class. Furthermore, in the low category it is more dominated by the control class than the experimental class and the very low category is only filled by students in the experimental class.

**Normality test**

This normality test was carried out using the Kolmogorov-Smirnov test in the SPSS application and the results of the analysis can be seen in table 4 below.

**Table 4**

**Normality test**

**Tests of Normality**

| | Class | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistics | df | Sig. | Statistics | df | Sig. |
| Energy Literacy Skills | Pretest A Experiment | .106 | 20 | .200 | .957 | 20 | .486 |
| | Posttest A Experiment | .158 | 20 | .200 | .946 | 20 | .305 |
| | Pretest B Control | .238 | 20 | .200 | .881 | 20 | .168 |
| | Posttest B Control | .202 | 20 | .105 | .912 | 20 | .200 |

*. This is a lower bound of the true significance

a. Lilliefors Significance Correction

Based on the data in table 4, it can be seen that the Sig. value for the experimental pretest data, and the experimental posttest, and posttest is 0.200, this indicates that the value is greater than sig. 0.05 or 0.200 > 0.05 so it can be concluded that the data is normally distributed. Meanwhile, for the experimental pretest data, the value is 0.200, this indicates that the value is greater than sig. 0.05 or 0.200 > 0.05 and the control posttest normality test using SPSS is 0.105, which indicates that the value is also greater than 0.05 or 0.105 < 0.05 so it can be concluded that the control pretest data is normally distributed.

**Homogeneity test**

This homogeneity test was conducted using a one-way ANOVA test in the SPSS application. Based on the results of the homogeneity test using the SPSS application, the Energy Literacy Ability data in the pretest obtained a Sig. value as shown in Table 5 below.

**Table 5**

**Pretest homogeneity test**

**Test of Homogeneity of Variances**

Energy Literacy Skills

| Levene Statistics | df1 | df2 | sig |
|---|---|---|---|
| .1.619 | 1 | 38 | .211 |

Based on table 5, it can be seen that the Sig. value of the pretest data is 0.211, which indicates that the value is greater than Sig. 0.05 or 0.211 < 0.05, so it can be concluded that the pretest data on Energy Literacy Ability of class X students of SMA Negeri 29 Bone comes from a homogeneous class.

**Table 6**

**Posttest homogeneity test**

**Test of Homogeneity of Variances**

Energy Literacy Skills

| Levene Statistics | df1 | df2 | sig |
|---|---|---|---|
| .078 | 1 | 38 | .782 |

Based on table 6, the Sig. value of the posttest data is 0.782, which indicates that the value is greater than 0.05 or 0.782 > 0.05. So it can be concluded that the posttest data on Energy Literacy Skills of class X students of SMA Negeri 29 Bone comes from a homogeneous class.

**Hypothesis Testing**

The following for the pretest of the experimental class and the control class has been obtained in the normality test that both data are normally distributed and the homogeneity test also proves that the pretest data of the experimental class and the pretest data of the control class come

from a homogeneous class. So the research hypothesis test can be carried out using a parametric statistical test, namely the independent sample T test. The results of the hypothesis test on the pretest data can be seen in table 7 below.

**Table 7**
**Pretest hypothesis testing**
**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig | t | dt | Sig (2-tailed) | Mean Difference | Standard Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Energy Literacy Skills | Equal variances assumed | .1619 | .211 | 12,459 | .38 | .001 | 27,800 | 2,231 | 23,283 | 32,317 |
| | Equal variances nor assumed | | | 12,459 | 34,532 | .001 | 27,800 | 2,266 | 23.26 | 32,332 |

Based on the results of the hypothesis test using the SPSS application using the independent-samples T test, the Sig. (2-tailed) value can be known on equal variance assumed because the data is homogeneous, which is 0.001, which means the value is smaller than Sig. (2-tailed) or 0.001 <0.05, which indicates that the hypothesis is significant and there is a difference in students' Energy Literacy Abilities after being given the problem-based learning model in the experimental class and the conventional learning model in the control class, which means H0 is rejected and Ha is accepted, namely there is a significant influence on students' Energy Literacy Abilities.

**Table 8**
**Posttest hypothesis testing**
**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig | t | dt | Sig (2-tailed) | Mean Difference | Standard Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Energy Literacy Skills | Equal variances assumed | .078 | .782 | 4,992 | .38 | .001 | 14.35000 | 2.87482 | 8.53023 | 20.16977 |
| | Equal variances nor assumed | | | 4,992 | 37,822 | .001 | 14.35000 | 2.87482 | 8.52933 | 20.17067 |

Based on the results of the hypothesis test using the SPSS application using the independent-samples T test, the Sig. (2-tailed) value can be known on equal variance assumed because the data is homogeneous, which is 0.001, which means the value is smaller than Sig. (2-tailed) or 0.001 <0.05, which indicates that the hypothesis is accepted and there is a difference in students' Energy Literacy Abilities after being given the problem-based learning model in the experimental class and the conventional learning model in the control class, which means H0 is rejected and Ha is accepted, namely there is a significant influence on students' Energy Literacy Abilities.

## DISCUSSION

The research entitled The Influence of Problem Based Learning Model Assisted by Inshot Video Learning Media on Students' Energy Literacy Skills with the aim of describing Students' Energy Literacy Skills using the Problem Based Learning learning model, describing Students' Energy Literacy Skills using the Problem Based Learning learning model without the help of Inshot video and describing the influence of the Inshot video learning model on the energy literacy skills of class X students.

Based on the descriptive data analysis that has been carried out, it shows that the pretest of Energy Literacy Ability of class X E1 students (experimental class) has an average value of 20.45 with a standard deviation of 11.78 and a variance value of 138.77. Meanwhile, for the pretest data of Energy Literacy Ability of class X E2 students (control class), the average value is 19.75 with a standard deviation of 6.44 and a data variance of 41.47.

The standard deviation value of the experimental class is higher than that of the control class. Likewise, the variance value of the experimental class is higher than that of the control class, which is much higher than the control class, indicating that the experimental class data points are spread around the average value.

Meanwhile, for the posttest data of Energy Literacy Ability after descriptive analysis, it shows that the average score in class X E1 (experimental class) is 61.1 with a standard deviation of 9.11 and a variance of 82.99. Meanwhile, in class X E2 (control class) after descriptive analysis, it shows that the average score of students is 46.5 with a standard deviation of 7.63 and a variance of 58.22.

The level of Energy Literacy Ability of class X E1 students as an experimental class taught using the Problem Based Learning learning model assisted by inshot video learning media obtained an average value of 61.1. Meanwhile, the level of Energy Literacy Ability of class X E2 students as a control class using the conventional learning model obtained an average value of 58.22.

Based on inferential analysis using SPSS application, pretest and posttest research data of Energy Literacy Ability were tested using normality test, homogeneity test, and hypothesis test. The first thing that was done was using normality test using Kolmogorov-Smirnov test in SPSS

application and showed that pretest experiment and posttest experiment data were normally distributed because Sig. value because obtained 0.200 is greater than Sig. 0.05 or 0.200> 0.05. while for pretest control data Sig. value is 0.200 and posttest is also normally distributed because Sig. value is 0.105 which means it is greater than Sig. value> 0.05.

The next test, namely the inferential test conducted on the research data that has been obtained, is the one-way ANOVA homogeneity test. The homogeneity test is conducted to determine whether the research data that has been collected comes from a homogeneous or not. This homogeneity test is carried out using the one-way ANOVA test in the SPSS application. The criteria for data originating from a homogeneous class if the Sig. value is > 0.05. Based on the homogeneity test conducted on the pretest, it shows that the data is homogeneous because Sig. 211 > 0.05. While the posttest data comes from a homogeneous class because the Sig. value is 0.782 > 0.05.

Next, hypothesis testing was conducted on the pretest data from the experimental and control classes, as well as on the posttest data from the experimental and control classes. Hypothesis testing was conducted to determine whether there was an effect on students' Energy Literacy Skills in the experimental and control classes when given the pretest and posttest. Hypothesis testing was conducted by considering the prerequisite tests that had been conducted, namely the normality test and the homogeneity test. These prerequisite tests are the requirements for using the hypothesis test to be conducted.

Based on the normality test conducted on the pretest data of the experimental class, the data was normally distributed. Similarly, the pretest data of the control class was also normally distributed. Based on the independent-samples T-test conducted on the pretest data, it showed that the Energy Literacy Ability of the experimental class and the control class was the same because the Sig. (2-tailed) value was less than 0.05 or 0.001 < 0.05.

Meanwhile, for the posttest data, the results of the normality test show that both posttest data from the experimental class and the control class are all normally distributed and also homogeneous. Therefore, to conduct a hypothesis test, a parametric statistical test can be used, namely the independent-samples T test. Based on the results of the independent-samples T test that has been carried out on the posttest data, it shows that there are differences in students' Energy

Literacy Abilities after being given different treatments, namely by using the problem-based learning model assisted by inshot video learning media in the experimental class and using the conventional learning model in the control class. Therefore, the results of this study show a significant influence on students' Energy Literacy Abilities, the Sig. value (2-tailed) on aqual variance assumed because the data is homogeneous, namely 0.001 <0.05.

## CONCLUSION

Based on the research that has been conducted, it can be concluded that the results and discussion of the research based on the research objectives that have been set are as follows. 1) The level of Energy Literacy Ability of class X E1 students of SMA Negeri 29 Bone as an experimental class taught using the Problem Based Learning learning model assisted by inshot video learning media obtained an average value of 61.1 and is included in the moderate category. 2) The level of Energy Literacy Ability of class X E2 students of SMA Negeri 29 Bone as a control class taught using the conventional learning model obtained an average value of 46.5 which is included in the moderate category. 3) There is a significant influence of the Problem Based Learning learning model assisted by inshot video learning media on the Energy Literacy Ability of students in the experimental class with a hypothesis test coefficient value of 0.001 <0.05.

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