Application of Audio Visual Assisted Problem-based Learning Model on Problem-solving Ability, and Social Science Learning Motivation

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Article Info	Abstract
	The lecture method using abstract examples makes it difficult for students to understand social studies subject matter. This causes students not to be able to develop potential and passive learning activities. Therefore, effective learning models are needed and can trigger the activeness of students. Problem-based learning (PBL) model and the use of audio-visual media are among the recommended learning models in Curriculum 2013 to improve the quality of learning. The purpose of this study is to examine differences in problem-solving abilities and to learn motivation between students who are given learning using audio-visual aided problem-based learning models, problem-based learning models, and lecture methods (conventional models). This study uses a quasi-experimental design in the form of a non-equivalent control group design. The research population is class VIII students, Public Junior High School 14 Pekalongan City with 242 students, with three sample classes, namely class VIII-C, class VIII-D, and class VIII-E. Based on the pre-test and post-test data, problem-solving ability and motivation questionnaire were statistically processed using the ANOVA test, $F_{value} > F_{table}$, then H_1 was accepted while H_0 was rejected. The results showed there were differences in problem-solving abilities, and learning motivation between students learning with PBL assisted models with audio-visual, PBL models, and lecture methods.

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INTRODUCTION

Social studies education has a strategic role and function in realizing effective and efficient social studies learning, as well as being successful and productive. Social studies learning is not just a process of interaction between students and educators, and learning resources in the learning environment, but also as an effort to improve abilities, and functional skills, as well as the development of students' professional attitudes and personalities (Pramono, 2013). One of the strategic functions of social studies learning is to improve students' problem-solving abilities.

Social studies were learning activities at Public Junior High School 14 Pekalongan has not run effectively, and efficiently. Students can present a good level of memorization, but do not understand the subject matter well. Most students have difficulty in understanding concepts, and they are not able to connect between the material being studied with the knowledge that they must understand. Another problem in social studies learning is that lecture methods still dominate learning activities and using abstract examples. This makes it difficult for students to understand the subject matter. In learning activities, students tend to be passive, shy, and afraid to ask the teacher. Students are less motivated in social studies learning activities. The average value of midterm tests for 2016/2017 school year is still below the Minimum Mastery Criteria (KKM). Learning activities have not been effective, and have not developed a critical mindset so that students have not been able to develop their potential optimally. The learning model used in learning activities is still not right, so it has not achieved the objectives of social studies learning as expected. The ability to solve problems has not yet been reached, and so the motivation to learn is still low.

Practical learning activities, challenging, fun, and with a conducive classroom situation can build, and develop thinking skills, critical thinking patterns, problem-solving abilities, and students' knowledge. Such conditions will also make students motivated in learning. Several learning models are recommended in Curriculum 2013, including project-based learning and problem-based learning. Project-based learning is learning that produces products. Products produced from project activities are in the form of concepts or miniatures. Teachers can start project activities by linking some environmental problems (Cintang, Setyowati, and Handayani, 2017). Based on the results of his research, Mitasari, and Rusdarti (2018) also argued that students were more likely to prefer direct practice-based learning. Students learn with challenging and fun situations because they are directly involved in learning activities. The subject matter is connected to environmental problems and everyday life.

Students become human beings who can solve their problems and their environment, such as the environmental problems in Sunarjan, Atmadja, and Romadi (2017) study that are very important to solve for the urban poor living in the Brintik hill cemetery. Their resources are very low below average. The solution is to solve violent economic and political poverty by using social values, and empowering communities in the Brintik hills.

Other research related to the learning model is the research of Kurniawan, and Pramono (2015) about the Social Science Learning Model Based on Industrial Problems. The results showed that this model was suitable as an alternative to implementing learning. This can be seen from the results of expert validation which shows the feasibility criteria, model trials, that the learning model has been useful for use, in the trial use states 100% of students have reached the Minimum Mastery Criteria (KKM) that has been set at school.

Problem-based learning model is also one of the recommended models in the 2013 curriculum for improving problem-solving skills. PBL learning helps students to process information already made in their minds, and compile their knowledge about the social world and its surroundings. This learning is suitable for developing basic and complex knowledge (Trianto, 2010). This model can be formed using a variety of existing media, including audio-visual media.

The use of instructional media allows students to develop potential, insight, and critical thinking, which can ultimately improve student learning outcomes. Because by using learning media, students will be freer to pour their ideas that are built based on information from various sources. PBL learning is assisted by audio-visual, learning material that is considered complex and difficult to solve and abstract, becomes easy, and fun. Audio-visual media can also visualize the subjects being studied. Inline with Dwyer research (2010) in Billik (2016) the use of audio-visual media in learning activities is a combination of the sense of sight and hearing which is the most effective way to learn an event or object.

The purpose of this study was to examine differences in problem-solving abilities and learning motivation between students who were given learning using an audio-visual aided PBL model, a PBL learning model, and lecture model.

METHODS

This research uses quasi-experimental design in the form of pre-test and post-test non-equivalent control group design. The research design is illustrated in table 1.

Table 1. Research Design

Class	Pre-test	Treatment	Post-test
Treatment 1	O_1	X_1	O_2
Experiment 2	O_1	X_2	O_2
Control	O_1	X_3	O_2

Information:
O_1 = Pre-test
O_2 = Post-test
X_1 = Treatment 1 (audio-visual PBL Model)
X_2 = Treatment 2 (PBL Model)
X_3 = Treatment 3 (Lecture Method)

This design involves two experimental classes and one control class. The experimental class (X_1) uses an audio-visual assisted PBL model, the experimental class 2 (X_2) uses PBL model, and the control class (X_3) uses the lecture method. Before being given treatment in the form of a learning model the three groups were given a pre-test (O_1) to determine the students 'initial ability, and after being given the treatment the third class's learning model was given a post-test

(O_2) to determine the students' problem-solving abilities.

Determination of the place of research is based on Sunarjan opinion (2014) which states that the selection of a research area is essential to be able to help simplify, and focus issues, especially when entering into the area we are with an open mind, and do not have the idea of solving the problems of others or knowing it before entering the region.

The population in this study were students class VIII of Public Junior High School 14 Pekalongan in the academic year 2017/2018. The sampling technique uses a cluster random sampling method. The sample used in this study was class VIII D as an experimental class 1 which was given audio-visual aid learning PBL model, and class VIII E as experimental class 2 which was given PBL model learning, while class VIII C is a control class, which is given a lecture learning model.

Data were analyzed using the Anova test. The use of ANOVA test in this study is to facilitate the analysis of several different sample groups with the smallest risk of error and to determine the significance of the average difference (μ) between one sample group with another. The instruments used in the research were problem-solving tests, motivation questionnaires, and student response questionnaires, learning videos, and student worksheets. To determine the ability of problem-solving tests, tests carried out before, and after learning. Descriptive statistics to determine students learning motivation, and descriptive percentages to determine students' responses.

Test the validity of the questions using content validity. The use of content validity test in this study aims to reduce variations in the potential for instrument error. The validity of items was tested using the product-moment correlation formula. The prerequisite test for analyzing sample data, before testing the difference in problem-solving ability, the prerequisite tests for normality and homogeneity were performed. Normality test in this study was conducted on the ability to solve problems. Normal testing using a Q-Q plot diagram requires

the Kolmogorov-Smirnov test with the help of SPSS. Homogeneity test aims to determine whether the experimental class and the control class have the same initial ability. The data used to find out about students' initial abilities are taken from pre-test scores. Homogeneity test hypothesis formulation:

$$H_0 = \sigma_1{}^2 = \sigma_2{}^2 = \sigma_3{}^2$$

(variants of class 1, 2 and 3 groups are homogeneous)

H_1 = one variant of different groups (the i-i sample group is not homogeneous.
Test criteria:
accept H_0 if sig > 0.05 with α = 0.05, and if vice versa then H_0 is rejected.

The hypothesis in this study is that there are differences in problem-solving abilities, and motivation between students who are taught using audio-visual PBL models, PBL, and lecture methods. ANOVA test was used to determine differences in problem-solving abilities between the experimental class and the control class, and then the Post Hoc test was further carried out. The hypothesis to be tested. $H_0 = \mu_1 = \mu_2 = \mu_3$ (the i-i mean of the sample is the same). H_1 = one of the different means (i-i mean of the sample is different).

Motivational data were obtained with a checklist instrument on the Likert scale, and then the data were analyzed with descriptive statistics. To find out students' responses to the application of audio-visual aided PBL models, and PBL was divided into questionnaires containing question items. The percentage formula for questionnaire score classification is as follows:

$$\text{Student response (\%)} = \frac{\sum \text{score obtained}}{\text{maximum score}} \times 100\%$$

RESULTS AND DISCUSSION

The study was conducted from October 20, 2017, to November 30, 2017, at Public Junior High School 14 Pekalongan, class VIII-D as experimental class 1, class VIII-E as experimental class 2, and class VIII-C as a control class.

Learning Implementation Plan experimental class 1 uses an audio-visual aided PBL model, experimental class 2 uses PBL model, while for the control class uses the lecture method (conventional model).

The research data were obtained from social studies learning outcomes of VIII grade Public Junior High School 14 Pekalongan before and after learning of audio-visual aids using PBL models in experimental class 1, PBL models in experimental class 2, and lecture models in control classes were analyzed using ANOVA test.

Description of Research Data Analysis Results

The results of the analysis of research data the average problem-solving ability of experimental class 1 before being given PBL learning assisted with audio-visual = 51.20 with standard deviation = 7.90, lowest value = 35.00, highest value = 65.00, average ability problem-solving experimental class 1 after being given PBL learning audio-visual aids = 84.80 with standard deviation = 5.25, the lowest value = 78.00, the highest value = 98.00. The average problem-solving ability of the experimental class 2 before being given PBL learning assisted with audio-visual = 50.71, with standard deviation = 8.95, lowest value = 38.00, highest value = 68.00, average class problem-solving ability Experiment 2 after being given an audio-visual aids learning PBL = 80.44, with standard deviation = 3.85, lowest value = 73.00, highest value = 90.00. While the average problem-solving ability of the control class before given lecture learning = 50.00, with standard deviation = 8.15, the lowest value = 38.00, the highest value = 68.00, the average problem-solving ability of the control class after being given learning lecture method = 68.62, with standard deviation = 7.81, lowest value = 58.00, highest value = 90.00.

The normality test calculation results obtained sig pre-test data is 0.169 > 0.05, pre-test data is normally distributed. So it can be concluded that the pre-test data of the experimental class and the control class is normally distributed. The sig value for post-test data is 0.983 > 0.05 post-test data for the experimental class, and the control class is normally distributed. So it can be concluded that the pre-test data, and post-test data of the

experimental class, and the control class is normally distributed. Homogeneity test was also performed on all three study samples. Homogeneity test using Levene test with significance level $\alpha = 0.05$ based on Levene test for homogeneity in pre-test of three study samples obtained value 0.823, post-test obtained sig > 1.000 > 0.05 and motivation obtained sig > 1.000 > 0.05, so it can be concluded that the data on problem solving skills and learning motivation in the three research classes were homogeneous.

The results of data analysis of students' learning motivation in experimental class 1, after being given PBL learning assisted with audio visual obtained an average value = 86.46, with standard deviation = 2.84, lowest score = 81, and highest = 91, experimental class 2 the average value = 81.21, with standard deviation = 3.84, the lowest value = 76, and the highest = 91. Control class average value = 73.62, with standard deviation = 7.02, lowest value = 60, and highest = 88. Motivation data sig value 0,696 > 0,05 motivation data have normal distribution.

The normality test is based on the Kolmogorov-Smirnov test about the test of normality with a significance level of $\alpha = 0.05$, sig values higher than 0.05 means that H_0 is accepted so that it can be concluded that the pre-test and post-test data values from the three study samples were normally distributed. Homogeneity test calculation, the pre-test data obtained sig value 0.823 > 0.05, it can be concluded that the experimental class pre-test data, and the homogeneous control class. Post-test data obtained sig = 1.000 > 0.05, it can be concluded that the experimental class post-test data, and the homogeneous control class. Motivation data obtained sig values 1.000 > 0.05 can also be concluded that the motivational data are homogeneous. The value of problem-solving ability and motivation in the three classes of research has homogeneous variance.

Post Hoc test results with LSD found that the ability of solving audio-visual assisted PBL classes has a sig value of 0.967 > 0.05, PBL class has a sig value of 0.967 > 0.05, and a control class of sig 0.822 > 0.05, thus the ability PBL class

audio-visual aided students' problem-solving, PBL class, and control class, there are differences.

Students' Responses, after being Taught using an Audio-visual Aided PBL Model, and PBL

Students respond well to PBL audio-visual and PBL-assisted learning models. The results of the questionnaire responses of students in the experimental class 1 average = 85.21 (very positive category), and in the experimental class 2, the average = 83.05 (very positive category). Positive responses of students have a significant effect on improving problem-solving skills, and motivation to learn.

Based on the distribution of questionnaires given to students, this positive response includes indicators, as follows: (1) Interest in the learning model, experimental class 1 is on average 86.86 (very positive), and experimental class 2 is on average 83.85 (very positive), (2) Interest in the use of media and learning resources, experimental class 1 with an average percentage of 85.00 (very positive), and experimental class 2 with an average percentage of 81.62 (very positive), (3) Facilitating participants to understand the problems of the experimental class 1 with an average percentage of 83.57 (very positive), and the experimental class 2 with an average percentage of 83.09 (very positive), (4) Facilitating students to understand the material, experimental class 1 with an average percentage of 85.43 (very positive), and experimental class 2 with an average percentage of 83.97 (very positive).

Students' perceptions of learning both using PBL and PBL-assisted visual models were classified as high, with an average of 85.21 in audio-visual PBL learning with highly positive student response categories and an average of 83.05 PBL learning by category. very positive. Based on the distribution of the questionnaire provided to the students, this positive response included all indicators of the learning model used.

The quality of student response to each aspect of the statement indicates that both models are student-friendly, almost all aspects, especially those that show interest in learning models, media interests and learning resources, facilitate

students to understand problems and facilitate students to understand the material to obtain positive response from students. These four aspects are very influential in learning outcomes, as can be seen from the results of the percentage of each aspect in a very positive category. Feedback shows that problem-solving ability is influenced by the quality of learning used by teachers in the classroom. Learning provided by teachers with the selection and application of appropriate, creative and innovative models will have a positive impact and will enhance student mastery of the subject.

The Difference in Scores of Problem-solving Abilities using PBL Assisted Models with Audio-visual, PBL, and Lecture Methods

Learning PBL models with audio-visual aids, PBL models, and lecture methods in this study are illustrated through the results of post-test score of problem-solving abilities. The results of problem-solving ability score after being given treatment in experimental class 1 (PBL with audio-visual aids) 84.57 = very high category, experimental class 2 (PBL) 80.22 = high category, and control class (lecture method) 68.38 = medium category. The completeness of the experimental class 1 reached 100%, the experimental class 2 was 85%, and the control class was only 15%, from the data it showed that the experimental class 1 and experiment 2 obtained higher problem-solving abilities compared to the control class. Statistical test results show that there are differences in problem-solving abilities between students who are taught using audio-aided PBL models, PBL models, and lecture methods. The difference between pre-test and post-test problem-solving abilities can be seen from the following figure 1.

Figure 1 shows the average value of pre-test and post-test problem-solving abilities. Based on the above data it can be concluded that problem-solving ability of students who use audio-visual PBL models is higher than PBL models, and problem-solving abilities of students who use PBL models are higher than the lecture method. The audio-visual assisted PBL model has the advantage of improving problem-solving

abilities because it can encourage students to build, and find their knowledge through problem-solving provided. The application of audio-visual aided PBL models helps teachers to stimulate students with a variety of knowledge related to the material so that students' curiosity increases. In this learning activity, the teacher gives assignments to students in the form of practical problems that exist in daily life following the subject matter. Learners are asked to find solutions to their solutions in group discussion forums, through this learning model students look for their knowledge, and the teacher acts only as a facilitator.
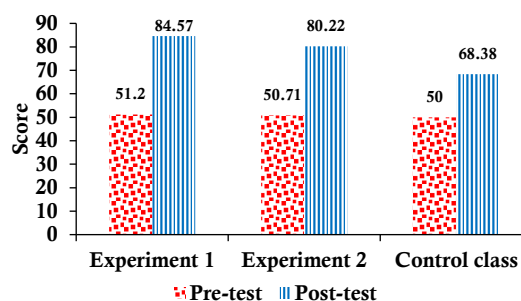
Figure 1. Average Pre-test – Post-test Value Problem-solving Capability

The Difference in Motivation Scores in Experiment 1, Experiment 2, and Control Class

Data on learning motivation of students is obtained by using an instrument in the form of a checklist in the Likert Scale. The data obtained can be seen in figure 2.
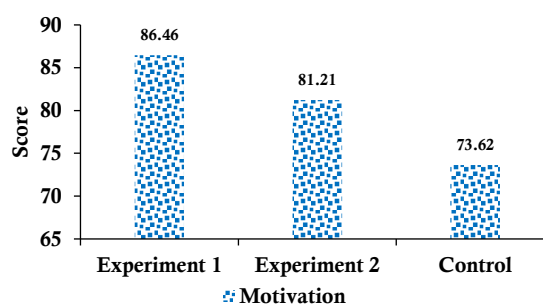
Figure 2. The Average Value of Experimentation and Control Class Motivation

The results showed that there were differences in student motivation in the experimental class 1, experimental class 2, and

control class. The experimental class 1 gained an average value = 86.46, the experimental class 2 gained an average value = 81.21, and the control class gained an average value = 73.62; thus the experimental class 1 had a higher motivation than with the experimental class 2, and the control class. Based on the motivation criteria, it can be seen that students who are taught using PBL assisted models with audio-visual to have very high motivation criteria, PBL models with high-level motivation criteria, while students who are trained using the lecture method with high motivation criteria at the lower level.

The results of the motivational scores indicate that PBL learning assisted with visual audio has a great influence on student learning motivation. Learning PBL with the help of audio visuals is a collaborative learning that trains students to work in groups. Observations on learning show that students' motivation for learning PBL with the help of audio visuals is better than learning using the PBL model and lectures (conventional).

Based on the findings of the study, the students' are motivated to work on the Student Worksheet. During their learning activities the students were very active and enthusiastic. Students are excited about their learning because students get a clear picture by looking at examples of problems in the audio visual media and they are given the confidence to practice problems in everyday life related to Plurality of Indonesian society materials. This is very positive in the learning process as it shows that there is a strong extrinsic motivation for students to solve problems with their own thinking. Students must be able to solve this problem in a group discussion forum. Students must work together to solve a given problem. This learning can motivate students, whose higher ability will motivate less active students to solve problems. Confidence, freedom and responsibility in learning also emerge from the worksheets they work on. This is in line with Schunk and Zimmerman (2004) in Billic (2016) who studied how motivation can come either explicitly (externally) or intrinsically from students trying to shape their achievement.

Based on observations during learning, students' motivation arises when the problems presented vary between groups and groups. Students are very excited about doing the worksheets. Enthusiastically, they believe that they can solve problems together in a group. Severe curiosity is motivated intrinsically so that they exchange experiences in direct learning to obtain information that is the learning material they must master. When teachers successfully implement PBL learning with the help of audio visuals, students will be motivated, actively engaged in their own learning, and successfully solve problems presented by teachers. In addition, students will be able to demonstrate skills in discussion. And finally they will compete between groups, this demonstrates high levels of student engagement, work ethic, cohesiveness, and increased student confidence. Students who are taught with PBL audio will gain useful knowledge in the real world. Learning PBL with the help of audio visuals can also generate interest even in materials considered difficult.

Chung, Yeh, and Chen (2015) stated the superiority of PBL model results of his research showed that after applying PBL learning, it encouraged students to learn proactively, and foster a critical attitude, and problem-solving abilities. This opinion is also supported by Hung, Jonassen, and Liu (2008) which states that PBL learning is the most innovative learning method in the history of education. Learning activities become meaningful.

The results of Natakusuma, Suroso, and Hardati (2017) research also support Hung, Jonassen, and Liu (2008) and there is an influence on how to study on student learning outcomes. The right way or model of learning can improve student learning outcomes. Students can understand the concepts they learn through direct, real experience that connects the ideas in Social Sciences subjects with real problems in everyday life. Learners are trained to assume responsibility, sharpen thinking skills to a higher level through activities identifying problems, analyzing problems, and finding solutions to problem-solving. These learning steps can improve problem-solving skills, and motivation

to learn, which can further enhance student learning outcomes.

The use of media in PBL learning is more interesting, effective, and enjoyable. Sanjaya (2011) argues that the use of media in the learning process can increase students 'learning motivation so that students' attention to learning material increases. Submission of learning the material with video media involves students in an active, collaborative learning process, student-centered, developing problem-solving abilities, and independent learning abilities that are indispensable to face challenges in life.

The superiority of PBL model by using the media is proven by Billik (2016) stating that PBL model assisted with audio-visual influences on the improvement of problem-solving abilities and students' learning motivation. The same study was also conducted by Khoiri, Rochmad, and Cahyono (2013) using multimedia-assisted PBL models, stating that problem-solving ability of students who use this model achieves classical completeness, better results from expository learning, and the ability to think creatively positively influences the ability of problem-solving learners.

Likewise, the results of Taryadi, and Rusdarti research (2018) showed that classes using problem-based learning model assisted by comic media get better results compared to classes that use conventional methods.

Learning using audio-visual aided PBL models has proven advantages, and a significant influence on improving problem-solving abilities, and students' learning motivation compared to PBL models, and lecture methods. The ability to solve problems and motivation of students increased significantly with learning PBL assisted models with audio-visual. PBL model with audio-visual aid is better than PBL model learning, and PBL model learning is better than learning using the lecture method.

The results of this study prove the truth of the theory of Constructivism raised by Jean Piaget. Piaget states that learning is a process that resembles and connects experiences or lessons learned with the understanding they have, so that their knowledge can be expanded. In learning students model PBL must solve problems and find something for themselves so that they can develop their knowledge according to their experience and understanding. Students are encouraged to study problems based on prior knowledge and experience.

In theory Cognitive Development Piaget states that children are developing because of cognitive development. Learning LLs with audio-visual learners helps them gain knowledge and experience tailored to their cognitive development. Knowledge and experience in keeping with high school students' cognitive development or syllabus and lesson plans, students will find it easier to find and understand new and difficult concepts.

Likewise with David Ausubel's Theory of Learning Theory, the results of this study has proven the truth of Ausubel's theory. According to learning that Ausubel is a process of linking new information to relevant concepts that exist in one's cognitive structure. Learning activities are just as important, students must be active. The results showed that learning activities of PBL models assisted by audio visual students are given the widest opportunity to be active in learning activities. By engaging students in learning and learning materials that connect new information to the best of their ability and knowledge, learning outcomes are maximized. Students can understand the concepts they are learning through direct and real-life experiences that link concepts in the subject of social studies to real-life issues and provide opportunities to showcase their best skills. Students are trained to take responsibility, develop thinking skills to the next level through activities that identify problems, analyze problems and find solutions to problem solving.

Students can also make their own assessments of the mistakes they make and then correct the mistakes they make so that they do not make the same mistakes. These learning steps can enhance student learning outcomes.

In learning activities, students appear to be more active and interested in learning materials. Students appear more confident, free and shy or afraid to ask questions, including things they

don't know in a discussion forum. Video playback learning makes learning more engaging and enjoyable; students pay attention to the video being broadcast. The featured video contains material on Diversity in Diversity, Harmony Diversity, Beautiful Country of Indonesian Unity, Multicultural Diversity of Indonesia. The complex problems of Indonesian society that students find difficult to understand are easy and interesting so that students can better understand the material provided and then find ways to solve their own problems.

This is also consistent with the Discovery Bruner Learning Theory which states that the Discovery method is a concept underlying the PBL model, that students are having problems and that they are trying to find a way to solve it. This finding is knowledge related to the knowledge of the material being taught. At PBL every concept is related to another concept.

The use of the PBL model in this study provides the opportunity for students to develop the ability to solve their problems through teacher-provided problems and student-specific problems. This process will result in a stronger internationalization and retention of the concept once the facts are matched with the source of learning. Students will be more likely to learn and try to solve problems that arise or arise from themselves, so that the knowledge gained will more meaningful to the students. Therefore, the ability to solve student problems in applied learning can develop optimally.

Based on the explanations and the results of the research, it can be concluded that the PBL model is assisted with visual audio and the PBL is better than the conventional learning model in developing problem solving skills. The findings suggest that PBL learning models assisted by audio visuals and PBLs are better used in learning activities than conventional models to create more meaningful learning processes and produce better problem-solving and motivation to learn.

It can be concluded that learning using PBL models with audio-visual aids is better than learning using PBL models, and PBL learning is better than learning using a conventional (model) model. PBL assisted audio visuals are very accurate, interesting and fun compared to PBL and lecture models to improve student problem solving and student motivation.

CONCLUSION

The results showed there were differences in problem-solving abilities, and students' motivation to learn in the class that was treated using audio-aided PBL models, PBL models, and lecture methods..

The audio-visual aids PBL model proved to be quite significant in improving problem-solving abilities, and students' learning motivation compared to PBL model, and the lecture method.

The findings in this study indicate differences in problem-solving abilities, and learning motivation of students who are given learning by using audio-visual PBL models, PBL models, and lecture methods. But the learning motivation of the experimental class 1 reached very high criteria, the experimental class 2, and the control class both had high motivation to learn, but the experimental class 2 showed high criteria at the top level, and the control class showed high criteria at the bottom level.

Learning activities with the selection of the right model will have a positive effect on learning motivation, and mastery of subject matter.

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