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Problem Based Learning with ICT Based with Learning Creativity to Improve History Learning Achievement

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Abstract

The teaching and learning process were boring and made students' participation in the classroom learning activities less enthusiastic that could make students' achievement' decreased. The main objective of this study was to analyze the effect of the Problem Based Learning model-based ICT with students' creativity on historical learning achievement. This research was a quasi-experimental study with a factorial design. The samples of this study were 4 classes, and each class consist of 34 students and total 170 students. The instrument used were learning outcome tests in the form of multiple-choice questions and creativity tests in the form of essay questions. The data on this study were analyzed using inferential statistics with the Two Way Anova technique formula. The results of this study obtained Fcount = 28,908 with a significance value of 0,000 less than 0,05, obtained Fcount = 4,623 with a significance value of 0,033 less than 0,05, the obtained Fcount = 6,060 with a significance value of 0,015 less than 0,05. From the result of this study, it can be implied to improve historical learning achievement, problem-based learning models can be used as an alternative model to create an interactive learning environment.

Keywords: PBL, ICT, History Learning Achievement

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Introduction

In this current millennial era, almost all aspects of life cannot be separated from the use of technology, including education. The use of technology on the educational side is important to do to reinforce the teaching and learning process and make the students easier to access information related to the learning materials (Arrosagaray et al., 2019; Hasibuan, 2015). Technology has an important role in the teaching and learning process in schools. The role of technology in the learning process are to make teachers be able to deliver the materials by using computers, LCDs, projectors, active speakers, and also using the internet. The use of technology can increase quality and scope if it is used wisely for education and training, and also it has very important meaning for the welfare (Fernández-Gutiérrez et al., 2020; Gil-Flores et al., 2017).

The use of technology media is applied to all subject matters very well, especially to the materials that tend to only contain theories and sometimes make students feel bored quickly in class. One of the subjects that are considered very supportive if it is integrated with the use of technology is history. History is a subject that conveys knowledge, attitudes, and values regarding the process of changes and the development of Indonesian societies and the world from the past to the present (Zahroa et.al., 2017). Therefore, history is one of the subjects that is still being taught at the educational level. However, the fact that happened in

the reality, history lessons were boring for the students and even some students did not want to pay attention and ask questions related to the materials.

Most teachers did not properly use technology. In teaching and learning activities in schools, teachers tend to use conventional learning models or direct learning without linked the use of the latest technology, so that the learning process looked boring and made students less enthusiastic about the learning process. However, if the teachers use an innovative learning model by using technology such as computers, LCDs, and the internet, it will make students more comfortable and easier to engage the material presented by the teachers, such as in the form of a PowerPoint presentation.

This statement is supported by the results of the preliminary research that has been conducted at Public Senior High School of 1 Dawarblandong, especially in class XI IPA, which showed that the students' achievements obtained from learning history are still low. It is shown by the results of the Final Assessment of Semester 2 which showed that 30% of students who scored above the specified learning completeness criteria were 67, while 70% of students scored below the learning completeness criteria. Some students expressed difficulty in understanding the concept of history learning given by the teacher.

Based on the results of observations, the learning process at Public Senior High School of 1 Dawarblandong still dominantly used conventional learning models as an introduction to deliver the subject materials in the class, especially in Indonesian history subjects so that the learning situation in the classroom become monotonous and less attractive. This has an impact on the achievement of students' learning outcomes which tend to be low and did not reach the minimum completeness criteria (KKM).

Besides, students' creativity also looks low. Equally, the level of students' activity and attention to participate in learning was still low. Based on supervision results from the principal and collaborator teachers, the desire of students in learning Indonesian history to ask questions, answer questions, and their willingness to take notes were also still low even though based on the preliminary result, the class has good skills and score.

The teachers' reason still used the conventional learning model was because many historical materials were presented in a limited time, but the teachers did not realize that the use of this model in history subjects made the learning process less interesting. The students felt that they were listening to a fairy tale which eventually becomes sleepy and falls asleep in class. The teacher should be evaluated the learning techniques that were used so that students become more active and interested when they learned history subjects. The concept of learning material delivered by the teacher only based on the theories that were taken from books and the teacher did not relate the material concepts to the real-life situation and did not show a direct relationship with the problems that happened in everyday life.

To solve the learning problems, especially the learning achievement and increase the students' creativity, especially in learning the history of the Indonesian language, teachers need to design innovative learning technique by using an effective learning model to make students understand the concepts and problem-solving skills of student learning in class so that students be more interested in learning. One of the learning models that is proper with the provisions of the scientific approach and considered as an effective model for students' problem-solving abilities is Problem Based Learning (PBL). The PBL model is an innovative learning model that can provide active learning conditions for students because the problems are the focus of learning which can be solved by students through groups (Mutakinati et al., 2018; Ngalimun, 2017).

Problem-based learning model is a learning model that focuses students on a problem in the real-life (contextual) environment so that it can improve students' ability to understand concepts and think critically (Mutakinati et al., 2018). Problem Based Learning is a learning model that involves students in solving a real problem, which causes the development of

students' motivation and curiosity (Sa'diyah, 2020; Gunantara et al., 2014). In general, the advantages of the problem-based learning model are students will get used to facing problems and feel challenged to solve these problems. Besides, students will be accustomed to learn in groups so that the learning process did not monotonous and focused on students in learning will be longer because students get to focus on the problem that given by the teachers (Rahayu & Fahmi, 2018).

Many studies that have been conducted related to PBL include research conducted by (Rahayu & Fahmi, 2018) states that the mathematics learning outcomes of students who use the problem-based learning (PBL) model are more effective than the mathematics learning outcomes of students who use the inquiry model. Research conducted by (Haji et al., 2015) states that PBL learning and the handouts could improve the student independent learning and concept understanding on the rotational dynamic.

However, to maximize learning activities in history subjects in order to get maximum results in the learning process, teachers do not only use innovative learning models which also support the achievement of learning objectives. Teachers also need to integrate learning models with the use of technology that already developed nowadays so that the solutions offered are based on ICT (Information and Communication Technology). The implementation of this study also supports the statement of Permendikbud No. 22 regarding to the learning at the primary and secondary education levels, which states the lesson plans that are prepared need to look up at the implementation of information and communication technology which is integrated, systematic, and effective manner according to the situations and conditions.

ICT is a component of learning resources that contains teaching materials which based on students' environment in the form of information and communication technology. In other words, this media means of distributing information in the form of hardware, software, network, and computer systems as well as telecommunications infrastructure so that the data can be spread and accessed globally (Nursamsu & Kusnafizal, 2017). Therefore, in order to make the learning process by using the PBL model can run optimally, it is necessary to have learning media that implement ICT.

PBL must be adapted the local conditions, educational goals, and cultural traditions to overcome human resource limitations in using ICT (Dwi et al., 2013). If PBL based ICT is done well in the learning process it will be able to support students' learning to be successful (Kristinawati et al., 2018; Yassin, 2010). Students will be able to use technology such as computers so that students' creativity can be applied to make a PowerPoint or insert the learning material on a video. In improving PBL learning achievement, students can improve their ability and understanding in solving problems so that history learning becomes fun and not be boring.

Researches on the implementation of the Problem Based Learning model-based ICT has been conducted before. The use of the PBL model-based ICT has a positive effect on students' problem in understanding abilities (Suwasono & Puspitasari, 2016). Then, the same research was also showed the results of the use of Problem Based Learning model-based ICT is better than using conventional learning models to improve students' learning outcomes (Kristinawati et.al., 2018). From the results of these relevant studies, it can be concluded that the ICT-based PBL learning model has a positive impact.

This study aimed to determining the effect of the Problem Based Learning model-based ICT with the Problem Based Learning Model-based non-ICT with learning creativity on history learning achievement in class XI IPA of Public Senior High School 1 Dawarblandong 2019-2020 academic year. By implementing Problem Based Learning based ICT it is hoped that it can solve problems related to creativity and learning achievement.

Materials and Methods

This research was quasi-experimental research. The type of research design used a 2x2 factorial design. The population in this study were all students of class XI of Public Senior High School 1 Dawarblandong on semester 1 of the 2019/2020 academic year which consist of 5 parallel classes in class XI IPA 1, XI IPA 2, XI IPA 3, XI-IPA 4, and XI-IPA 5, and each class consists of 34 students and total 170 students. From this population, the class was taken by cluster sampling (Sedgwick & Philip, 2014). The units sampled were not individual students, but class (clusters) in class XI of Public Senior High School 1 Dawarblandong in the 2019/2020 academic year. Class XI IPA 1 and class XI IPA 3 were the experimental group. Those samples treated by the PBL model were based on ICT and the class groups XI-IPA 2 and XI-IPA 5 were the control classes treated with the PBL model not based on ICT.

The research instrument used in this research was the learning utilizes used in the experimental class and the control class consisted of Student Worksheets (LKS) and Lesson plan. The measurement of the instrument developed consisted of a creativity test of historical learning and historical learning outcomes. The history learning achievement test was used to determine students' mastery of the material after participating in the learning process. The learning outcome test was designed in the form of a multiple-choice test with five alternative answer choices.

Before the instrument was used, the instrument was validated by an expert. Validation of student worksheets and lesson plans were needed to see the suitability of the learning objectives with the material that students must be mastered after the learning process is over. The instrument in the form of a learning outcome test and a student creativity test was validated by an expert conducted by the head of the MGMP history. After the instrument was validated based on expert judgment, then the item validation was carried out by empirical instrument testing.

The data used in this study were test value data obtained through learning outcomes tests and student learning creativity tests. Before testing the hypothesis and testing the prerequisites for the analysis, namely the normality test and the homogeneity test, the initial similarity test of the samples used is carried out first. After the prerequisite test was conducted, the research hypothesis was tested using Two-Way Anova. Hypothesis testing was used to test the differences in creativity between the experimental class and the control class, test the differences in creativity between students who had high and low creativity, and saw the effect of the interaction of learning models (PBL models-based ICT) and learning creativity on learning achievement. Hypothesis testing was done with the help of the statistical program SPSS 25 for windows.

Results and Discussion

Description of History Study Achievement Data

In this study, the data on students' History Learning Achievement was obtained from the History Learning Achievement test which was carried out after receiving learning treatment, so that the results of the average value of History Learning Achievement by learning using ICT-based PBL were obtained amounted to 78,52 and the average value of achievement in learning History with PBL without ICT is 72,05.

Description of Student Creativity Data

In this study, the data on student creativity obtained from learning creativity were presented in the Table 1.

Table 1. Description of Student creativity is taught using PBL based ICT

Learning Creativity Using Problem Based Learning based ICT	**Frequency**	**Percentage**
Low student creativity	21	30,9
High student creativity	47	69,1
Total	68	100,0

Thus (this is better to describe an academic writing), from the Table 1 it can be stated that from the 68 students there were 47 students (69,1%) who had high creativity results, and 21 students (30,9%) have low creativity.

Table 2. Description of Student creativity is taught using PBL without ICT

Learning Creativity Using Problem Based Learning based ICT	**Frequency**	**Percentage**
Low student creativity	29	42,6
High student creativity	39	57,4
Total	68	100,0

Thus, it can be stated that from the 68 students there were 39 students (57,4%) who had high creativity results, 29 students (42,6%) had low creativity.

Hypothesis Test Results

The results of the two-way Anava test from the creativity table above are described as follows:

First Hypothesis Testing

Two Path test results obtained Fcount = 28,908 with a significance value of 0,000 less than 0,05. This result means that the null hypothesis (Ho) is rejected, which means that the learning achievement of the group of students who learned through the PBL model and the group of students taught through the PBL model based on the different ICT. It can also be explained that there were significant differences in the learning achievement of groups of students who are taught through the PBL model not based on ICT and groups of students who are taught through the PBL model with ICT-based.

Second Hypothesis Testing

Two Path Anava test results obtained Fcount = 4.623 with a significance value of 0.033 less than 0.05. This result means that the null hypothesis (Ho) is rejected, meaning that the learning outcomes of groups of students who had high creativity and groups of students who had low creativity were different. It can also be explained that there were significant differences in the learning outcomes of students who had high creativity and groups of students who had low creativity. Student creativity had a strong effect on the value of learning achievement (Mutakinati et al., 2018).

Third Hypothesis Testing

The results of the Anava Two Path test showed that the value of Fcount = 6,060 with a significance value of 0,015 was less than 0,05. These results can be interpreted that the null hypothesis (H0) is rejected, which means there was an influence of the interaction of learning models (PBL models and PBL models-based ICT) and student creativity on the learning achievement.

Based on the first hypothesis, the results obtained was the learning achievement of groups of students who learned through PBL models and groups of students taught through PBL models based on ICT was different. It can also be explained that there were significant

differences in the learning achievement of groups of students who were taught through the PBL model not based on ICT and groups of students who were taught through the PBL model with ICT-based. This is because a conducive learning environment also able to stimulate students' motivation. The motivational factor will foster positive beliefs about their ability to complete the task which will help to improve students' understanding (Wu & Wu, 2020). Thus, the ICT assistance provided did not only have an impact on students 'knowledge and skills, but can also motivate and increase students' confidence when solving problems with various kinds of solutions. The PBL model is also capable to create peer interactions during the investigation process. Students who were taught using PBL only get help from peers, but did not get help (scaffold) from ICT. There is a weakness in peer feedback in the investigation process due to the absence of scaffold in the peer feedback interaction process (Seng & Hill, 2014).

Learning resources in the form of PBL-based Local Environment student worksheets strengthen students' environmental literacy in identifying, analyzing, evaluating, and planning actions as well as sensitivity to local and global environmental problems (Suryawati et al.,2020). Then, the other research mentioned that learning by using the PBL model gives students sufficient thinking skills to critique their own plans for systematic practice, and able to construct realistic critiques of their thinking powers to solve contextual problems (Mutakinati et al., 2018). Other research also stated that the learning achievement of students taught by PBL through ICT was significantly higher than students taught by conventional learning (Kristinawati et al., 2018).

Based on the second hypothesis, the results obtained from the learning outcomes of groups of students who had high creativity and groups of students who had low creativity were different. This is because students who have creativity will find it easy to solve the problems that they found in the learning process. In the learning process, students will find problems and difficulties in the form of questions that require creativity in solving the problems. Students who have creativity will be more transfer knowledge easily to gain new knowledge and apply historical concepts to the problems that require variations in answering and propose new ideas. Students should be equipped with the skills needed to be creative in solving the problems that they faced (Suprapto et al., 2018; Gunawan et al., 2017). PBL based ICT will increase students' creativity because the PBL model is a learning model that is carried out by challenging students with problems that existed in students' daily real life so that students can construct their knowledge in solving problems that they faced and encourage students to think creatively. The ability to think creatively has characteristics such as coming up with many ideas, answers, solving problems or questions, providing many ways, or suggestions for doing various things (Rohana & Wahyudin, 2017). The ability to think creatively is needed to support the learning process so that it will have a positive influence on learning outcomes.

The result of this study is supported by the previous study which stated that spatial intelligence and students' achievement can support creativity, especially in the inductive approach (Suprapto et al., 2018). Another research that supported this research which stated the results of the study indicated the variables of creativity and motivation affect learning outcomes by 88.5% (Listiani, 2014).

Based on the third hypothesis, the results obtained that there was an influence of the interaction of learning models (ICT-based PBL) and students' creativity on learning achievement. This is because the PBL model which is integrated with ICT makes learning activities more interesting and less boring because it cannot be denied that students are currently more interested in seeing electronic properties rather than viewing textbooks. Interesting learning will make students not be bored in participating in the learning activities because interesting learning will eliminate monotony and boredom in students (Athanases et

al., 2020; Roling et al., 2020). In the learning process, this PBL model is integrated with ICT so that it is interesting and does not make students feel bored. Students are also more interested in paying attention to the material and making it easier for them to understand about what has been received so that it will have a positive effect on student's achievement. PBL model will make students to more creative. Creativity is the ability to initiate ideas, see new or unexpected relationships, the ability to formulate concepts that is not only just memorize but also create new answers to the existing problems and get new questions that is needed to be answered (Rohana & Wahyudin, 2017; Gunawan et al., 2017). PBL model makes students be more creative because students are trained to be able to solve problems that they faced with creative solutions from students' thinking. ICT is a media that make students interested and be enthusiastic in following the learning process so that students will be paid more attention to the learning process maximally (Arrosagaray et al., 2019). PBL model which is based on ICT will make students even more enthusiastic in participating in the learning process so that it will affect student creativity and learning outcomes.

The use of ICT in schools autonomously has a positive effect on PISA scores in mathematics and reading and a positive effect on PISA scores in science thus suggesting that the impact of ICT on educational outcomes depends on the subject and type of technology use (Fernández-Gutiérrez et al., 2020). The implementation of the Problem Based Learning (PBL) model with green chemistry insight can improve students' creative thinking skills and creative action. So, it can be denied that the PBL model has a positive effect on student learning outcomes (Nuswowati et al., 2017).

Based on these results, new findings in this study are that the PBL model-based ICT has a positive effect on student achievement. The PBL model is a learning approach that emphasizes scientific learning where students are required to actively get concepts by solving problems (Serevina et.al., 2018). Through the problems presented by the teacher, students' creativity will be more developed and students will be more eager to participate in learning activities so that it has an impact on increased student learning achievement. The contribution of research results in the scientific field can be used as a reference or consideration for the implementation of learning activities in class.

Conclusion

Based on the general description, hypothesis testing, and discussion, it can be concluded that there is a significant difference between the learning achievement of the group of students taught using PBL model-based ICT and the group of students taught using PBL model not based on ICT in class XI IPA students. In addition, there is a significant difference between the learning outcomes of groups of students who have high learning creativity and groups of students who have low learning creativity after being given PBL with an ICT-based approach. The PBL model-based ICT also affects the interaction of learning models and students' creativity on the history learning achievement of students in class XI IPA.

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