Application of the PBL Model with Exe Learning Media on Student's Motivation and Learning Outcomes

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Abstract. This study aims to apply the exe learning computer media program with the PBL model as an effort to increase motivation and improve student learning outcomes. The subjects in this study were class XI students of SMA Negeri 1 Garawangi, namely class A consisting of 32 students and class B consisting of 31 students. The research method was carried out using an experimental method, with a research design of pretst-posttest control group design. Hypothesis testing of learning motivation data and learning outcomes using Independent sample t-test. Based on the results of the study, it was concluded that the ability of students to use problem-based learning strategies integrated with the exe learning computer media program got higher motivation and learning outcomes. In practice, exe learning can present more interesting material, both audio and visual, according to the needs of students in the digital era. Based on the results of the study, that the increase in learning outcomes and student motivation with the application of the PBL model using the exe learning media was higher than the increase in the learning outcomes taught by the application of the PBL model without the exe learning media. This finding is relevant to the development of the industrial revolution 4.0 that in the world of education it is necessary to apply learning media that make it easier for teachers to deliver subject matter to technology-based students, in the world of education we usually know e-learning. Therefore, it is necessary to implement the use of other technology- based learning media in supporting a more varied and innovative learning process.

Keywords: learning outcomes; learning motivation; Exe Learning media; PBL model

1 Introduction

The development of Information and Communication Technology is growing and increasingly being applied to various aspects of life, not least in the world of education. Global demands demand that education and all its aspects must adapt to technological developments for the purpose of improving the quality and quality of education. Looking at the condition of the level of education in Indonesia based on information on numbers and HDI rankings (Human Development Index) it can be obtained a picture of the state of the welfare of the community as measured by the life expectancy of the people in a country by measuring health and nutrition, education as measured by the expected length of schooling and the average school participation, and standard of living as measured by GNI per capita [14].

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Effective education is an education that allows students to learn easily, fun and achieve the expected goals. Thus, educators (lecturers, teachers, instructors, and trainers) are required to increase

the effectiveness of learning so that learning can be useful. Relevant to current conditions in the digital era, it is important to use Information and Communication Technology in education. The use of Information and Communication Technology in education, especially in technology-based learning process activities, will be able to facilitate and expand access to the knowledge gained, it is felt that it will make it easier for anyone, especially students, to take part in learning in the 21st century.

One indicator of the low quality of education is reflected in the low learning outcomes obtained by students. Based on the facts in the field, it shows that the average student learning outcomes at SMA Negeri 1 Garawangi are below the Minimum Completeness Criteria (KKM) below 75. This evidence can be seen from the average student learning outcomes based on mid-semester and end- semester exam scores. Improving student learning outcomes cannot be separated from the teaching and learning process, because the teaching and learning process is essentially the core of activities in the educational process. Everything that has not been programmed will be carried out in the teaching and learning process that involves all learning components and will determine the extent to which the goals that have been set can be achieved. One of the learning components other than the teacher is the use of methods and media in learning. One of the goals of using learning methods and media in the teaching and learning process is that students are expected to easily accept and understand the material presented, based on several other research findings that learning models and methods have a positive correlation to improving student learning outcomes. Therefore, teachers should use appropriate learning methods and media in order to create a conductive learning atmosphere, encourage students' ability to be actively involved in teaching and learning activities, because active student involvement in the learning process will provide great opportunities for achieving learning objectives.

Based on the current digital era in line with technological developments, the role of teachers is also required to be able to integrate the development of information and communication technology in the learning process activities. At the implementation stage, teachers need to understand and apply various interesting, quality and innovative learning methods and media as one of the steps taken to maximize the quality of the learning process and results. The use of instructional media in the teaching and learning process can generate new desires and interests, and generate motivation for learning activities and even provide psychological effects for students [3].

E-learning program is one of the media that uses computer technology that can be used as a learning medium. Many E-Learning programs have been developed with various basic characteristics, namely providing student self-service, online learning, online assessment, collaborative learning, and training resource management [15]. Heinich et al (2005) stated that E-learning learning media can be designed and utilized so as to make learning that prioritizes problems and trains students' ability to solve problems and find solutions [5]. E-learning is effective and can improve the quality of learning where E-learning is designed to be centered on the abilities and activities of students. In addition, E-learning is an information and communication technology that is applied to enable students to learn anytime and anywhere.

One of the learning media that can be used as a technology-based digital learning media is Exe Learning. Exe Learning learning media is a website-based design program designed to assist teachers and academics in the design, development and display of web-based lessons

and teaching materials without the need for special skills in HTML, XML or website application programming skills. In addition, Exe Learning provides a variety of iDevices that allow you to insert various kinds of animations, simulations, quizzes, practice questions with feedback and so on.

As has been understood together that in the teaching and learning process, in addition to the application of methods and media by the teacher, the motivational aspect has an important role in achieving learning outcomes. Motivation has an important role in learning because it encourages individuals to carry out learning activities so that behavior changes occur to achieve goals in the form of high learning outcomes. A student who has high motivation tends to try to develop all his abilities and potentials to achieve the expected goals, namely in the form of high learning outcomes. Learning motivation is an encouragement to students both intrinsically and extrinsically which can lead to activities for better and more effective learning [12].

In addition, the use of learning media cannot be applied without a learning model, so it is necessary to combine learning models that are in accordance with learning media. E-learning can be successfully delivered in a well-designed context and must use a learning model [19]. States that problem-based learning makes learning a problem, then the problem can arouse students' interest or curiosity to actively solve problems with strategies created by students themselves by linking previous knowledge so that new knowledge is composed [4] [11]. The PBL learning model is a series of learning activities that emphasize the process of solving problems faced scientifically [1]. With the use of supportive constructivist learning, students can develop their own thinking skills. In this model the creativity and activeness of students will help them to stand alone in their cognitive lives. Given that each student has a different learning style, PBL provides opportunities for students to explore content (material) by using various means that are meaningful to themselves [7], and to conduct experiments collaboratively. The PBL model is an in-depth investment on a real world topic which will be valuable for the learning process carried out by students.

From the explanation of the background above, the formulation of the problem in this study is how does the application of the PBL model with Exe learning media affect students' motivation and learning outcomes?

2 Methodology

This research is quasi-experimental, by giving treatment through teaching using learning media innovations with learning models and comparing with the control group. The research design used the pretest-posttest control group design. More clearly the research design can be seen in table 1 as follows:

Table 1. Research Design

Subject	**Control Class (K_1)**			**Experiment Class (K_2)**		
Employment	Motivation	Learning Outcomes		Motivation	Learning Outcomes	
	M	H11	H12	M	H21	H22

The subjects in this study were students of class XI SMA Negeri 1 Garawangi Social Sciences Department. Class A consists of 32 students for a class that is given a problem-based learning strategy based on Exe learning media and class B consists of 31 students for a

class that is given a problem- based learning model. Data collection techniques were carried out using student learning outcomes tests, motivation questionnaires and interview results. The learning outcomes test is in the form of multiple choice with a total of 25 items that have previously been validated by the test instrument. The test in this study was given twice, namely pretest and posttest. Then the increase in student learning outcomes is calculated in the form of Gain. Motivation questionnaires were given at the end of the lesson for both classes. Where the motivation questionnaire is a set of written questions given to research subjects to be answered according to the actual situation.

Broadly speaking, there are two ways to use a questionnaire as a data collection technique, namely (1) distributed which is then filled out by respondents and (2) used as a guide for interviews with respondents. Interviews were only conducted for classes using the Exe Learning program computer media. The data analysis techniques used include: 1) data homogeneity testing; 2) testing the normality of the data with Kolmogorov-Smirnov; 3) hypothesis testing using independent sample t-test of two parties in the SPSS 23 for window program.

3 Results and Discussion

Before testing the hypothesis, the data on learning outcomes and motivation must meet the prerequisites. There are two prerequisites that must be met so that hypothesis testing can be carried out, namely normality and homogeneity tests. Normality test is used to determine whether the data population is normally distributed or not. The normality of the data was carried out using the

Kolmogorov-Smirnov test which was processed using SPSS version 23. The test criteria was to compare it with the sig value. ($\alpha = 0.05$) where if the value of Sig> 0.05 then the data is normally distributed, if the value of Sig <0.05 then the data is not normally distributed. The results of the calculation of normality data, the authors present more clearly in the form of a table below:

Table 2. Normality Test Results Pretest, Posttest, Gain, and Learning Motivation

Sig. Value	**Experiment Class**		**Control Class**		**Gain**		**Learning Motivation**	
	Pre Test	***Pre Test***	***Pre Test***	***Pre Test***	***Eks***	***Kon***	***Eks***	***Kon***
Sig.	0,820	0,653	0,521	0,184	0,943	0,658	0,113	0,341
Desc	**Normal (>0,05)**							

Based on table 2 above, the pretest, posttest, gain and learning motivation data for both the experimental and control classes have data that are normally distributed. In addition to the data must be normally distributed, the absolute requirement that must be met is that the data must be homogeneous. The basis for decision making uses Levene Statistic calculations with SPPS version 21. The provisions are if the value of sig > 0.05 then the data is homogeneous, otherwise if the value of sig < 0.05 then the data is not homogeneous. The results of the homogeneity test of the pretest, posttest, gain and learning motivation of the two groups can be seen in the table as follows:

Table 3. Homogeneity Test Results Pretest, Posttest, Gain, and Learnng Motivation

Levene Statistic	***Pre Test***	***Pre Test***	**Gain**	**Learning Motivation**
Sig.	0,363	0,101	0,460	***0,102***
Desc.		**Homogen (>0,05)**		

Based on table 3 above, the pretest, posttest, gain and learning motivation data for both the experimental and control classes have homogeneous data. That is, the variance of students' abilities in the experimental class is identical to the variance of students' abilities in the control class. Furthermore, hypothesis testing using independent sample t-test can be presented by researchers more clearly as follows:

Table 4. Hypothesis Test Results

No	Data	***Sig. (2- tailed***	***α***	***Desc***
1	Student learning outcomes *(gain)*	0,032	0,05	Ha accepted
2	Learning motivation	0,019	0,05	Ha accepted

From the results of data processing student learning outcomes in the control class and PBL class with Exe Learning media, Ha is accepted, meaning that there is a significant difference in student learning outcomes taught using a problem-based learning model compared to student learning outcomes taught using a problem-based learning model that is integrated with Exe learning program computer media. From these results it can be concluded that exe learning media can improve student learning outcomes in learning. The exe Learning program computer media can present the material well so that students can easily understand the material and ultimately learning outcomes can increase significantly. States that e-learning presents features that can help students acquire knowledge [18].

The increase in student learning outcomes in the experimental class using the PBL learning model based on the exe learning media with the class using only the PBL model is more clearly seen in the graph as follows:

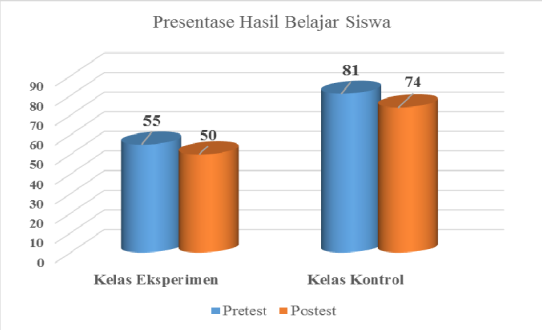

Figure 1. Graph of Student Learning Results

To find out the increase in student learning outcomes using the PBL method based on exe learning, a normalized gain calculation using the Hoke formula was used. From the results of the n- gain data analysis, it can be seen from the table below:

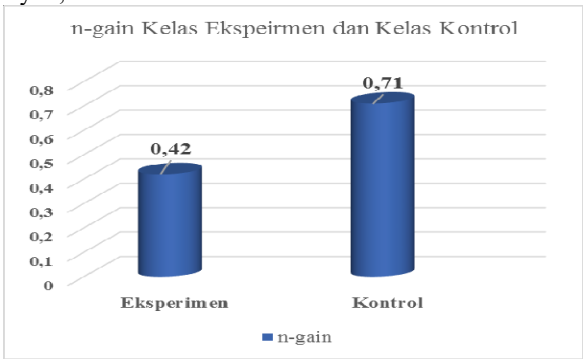

Figure 2. Graph of n-gain Results of Experiment Class and Control Class

Based on the results of the research that has been done, it is found that there is a significant difference between the learning outcomes of students who use the PBL method based on exe learning media and students who use the PBL method. After knowing the difference, it turns out that the experimental class that uses the Exe Learning-based PBL method has a higher level of motivation and learning outcomes when compared to the control class without the use of media.

From the interview questionnaire, it can be seen that the experimental class students (PBL + Exe Learning Program Computer Media) are very happy and enthusiastic about participating in economic learning because of the Exe Learning program computer media which has an attractive appearance. This program provides material that is complemented by videos and independent exercises that encourage students to be more active and creative in studying the material presented. Videos help students master abstract material. While independent practice helps students to practice working on questions and feel challenged because they automatically know the score obtained. This is in line with Boeker's research, (2013) that e-learning is more fun and can increase students' motivation. A previous study by Sulaiman et al (2013) compared problem-based learning with Moodle capable of developing students' creative thinking skills, especially flexibility, originality, and elaboration indicators [2].

In entering this digital era, a new paradigm is needed in the education system. Learning in this digital era is not enough just to practice skills in oneself but also life skills in society. Learning in this digital era is a strategy so that students are more comfortable in learning and have more insight or broad knowledge with relatively easy access so that they can produce an effective learning experience [15]. Teachers or educators are also very influential in the use of learning media. Teachers are not enough just to have knowledge about learning media, but also have to have a creativity or skill in the use and utilization of these media properly. In order to optimize the learning media, teachers should also receive training, considering that the media to be used is technology-based, so teachers should be very understanding about the media that will be given to students so that the use of the media runs optimally.

The selection and use of media in the context of utilizing digital-based learning media must be in accordance with the learning objectives and the level of student motivation. The application of appropriate learning methods with the use of learning media will make students more comfortable and interested in the learning process. Teachers who are able to properly utilize access to learning media and combine it with appropriate teaching methods, effectively and efficiently will be better able to create a good learning atmosphere and environment so that learning objectives can be achieved optimally. In learning at school, there are many learning models that utilize information and communication technology (ICT) or commonly called E-learning. E-learning is often interpreted as a form of web-based learning that can be accessed from the internet, local networks or intranets. E- learning materials do not have to be distributed online [4], but can also be offline, for example b using a CD/DVD and can be accessed in open source [8]. There are several advantages in the use of E-learning technology itself, including: 1) it is possible to distribute education to all corners of the country and unlimited capacity because it does not require classrooms. 2) the learning process is not limited by space and time as well as face-to-face in the classroom. 3) learning can choose topics or teaching materials according to the wishes and needs of each. 4) the length of time to learn depends on the ability of each. 5) the accuracy and current of teaching materials. 6) learning can be done interactively so that it is more interesting [9].

Based on research findings that the increase in student learning outcomes and collaboration taught by applying the PBL model using exe learning media is higher than the increase in student learning outcomes and collaboration taught by applying the PBL model without exe learning media [6] [10]. Therefore, the application of learning with E-learning is a medium that is expected to increase student activity, motivation and learning outcomes, because with the use of appropriate learning media it will be very useful to increase student motivation in learning, students become active and able to interact with others. teachers and other students, and make students able to learn independently. Independent learning is a way of learning that students do freely in determining their learning goals, whether it's planning the learning process, learning strategies, and in using the learning resources they choose. Therefore independent learning requires high motivation, desire, and responsibility to develop forward in knowledge.

Learning using the web or electronic learning (e-learning) has unlimited space and time to provide effective learning whenever we want to access it if we have computers, tablets, and mobile phones that are connected to the internet. So that the interaction of students and teachers becomes easier in real time [17].

The strategy of using E-learning in order to support the implementation of the learning process, is expected to increase the absorption of students regarding the material being taught, increase student activity, increase students' independent learning abilities, and expand the reach in the teaching and learning process using computer networks. To achieve these things, in the development of E-learning, it is necessary to note that the material displayed must be able to convey correct information, not only prioritizing the technology side, or its beauty, but it is necessary to pay close attention to how the teaching and learning techniques are used [10]. This proves that the use of Exe Learning learning media not only has a positive effect on student learning achievement, but also has a positive effect on learning motivation, where student motivation is higher when Exe learning learning media is applied. This is in line with research conducted by Siboro et al. (2017) that the results of this study indicate a positive relationship between student motivation and the use of Exe Learning mode in learning [13].

Learning using Exe learning can make learning variations that can be a way out to overcome student boredom and can stimulate students' motivation to learn independently so that students are interested in being active in understanding related to the material being studied, because the material presented in Exe learning is not only in the form of text material, but videos, pictures, and even practice questions that train students' abilities can be inserted, thus creating a more interesting and fun learning atmosphere for students. Exe Learning provides an opportunity for students to be in control of each other's success, because this Exe Learning can make students learn independently wherever and whenever, so students are certainly easier to explore what they need, and even if students do not understand something the material students can repeat or study again until they really understand the material. Because the use of web-based exe learning media is flexible, easy to access anywhere and anytime, so the learning process can be done dynamically and not limited by space and time.

4 Conclusion

The development of science and technology (IPTEK) has brought rapid changes in aspects of human life. One area that has had a significant impact on the development of science and technology is education. One of the science and technology products for learning is e-learning media. Based on the results of the study through analysis of data calculations and hypothesis testing, the researchers concluded that the increase in student learning outcomes and learning motivation by applying the PBL model using exe learning media was higher than the increase in learning outcomes by applying the PBL model without exe learning media. In the learning process, e-learning can be used as a learning medium that makes it easier for teachers to deliver subject matter to students based on technology.

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