

APPLICATION OF BLENDED LEARNING IN BASIC PROGRAMMING SUBJECT

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Abstract— The application of Blended Learning was based on the observation of learning activities in Basic Programming subjects in Vocational High School which have several obstacles, such as teacher-centered learning process, lack of student activity in learning, lack of interaction between teacher-students and student interaction. It had an impact on the achievement of student learning outcomes. The purpose of this study was to describe the profile of learning activities, so that from the results of the description researchers could develop improvement plans for learning to improve student learning outcomes. The method of this study was Class Room Action Research conducted in two cycles and each cycle consisted of several stages namely, plan, action, observation and reflection. The instruments used were guidelines for observing student activities, final learning evaluation sheets, and practical assessment sheets. From the results of the study after action, observation and reflection on students, Blended was able to generate motivation, students are more focused, directed in learning and more effective in utilizing learning time. Teacher-student interaction activities and students are more open so that student difficulties in learning can be overcome. It showed that blended learning can increase student and learning activities also student learning outcomes.

Keywords: *blended learning, basic programming subject*

I. INTRODUCTION

The development of information and communication technology advances in the 21st century is the e-learning century (Garrison, 2011) so that this phenomenon is referred to as a technological revolution and has an impact on the world of education including learning patterns and research in the classroom. Changes that will and are happening, mainly due to the potential and capabilities of information and communication technology that enable humans to interact and meet their needs for unlimited information. Some of the limitations that humans experienced in dealing with one another, such as distance, time, amount, capacity, speed and others, can now be overcome by developing various information and communication technologies and social media that are developing at this time.

The trend of Indonesian education in the future is: (1) the development of open education with distance learning mode; (2) sharing resources together between educational / training institutions in a network; (3) libraries and other educational instruments (teachers, laboratories) change functions into sources of information; (4) the use of information technology, multimedia, internet and social

media devices in education has gradually replaced TV and Video.

In this technological era, almost all human activities need the help of new devices that can easily help their activities. This implies educators and prospective educators to be able to utilize new technology in learning. thus, educators or prospective educators must be able and understand technology so that they can carry out their duties properly in accordance with the applicable curriculum.

Industrial revolution era 4.0 is a time when the industry combines technology products with the internet. this phenomenon has an impact on all aspects of life including education, especially vocational education, namely Vocational Middle School (F.R.andZ.Zhao. 2014). The development of technology by using the internet in learning today as one of the advances in communication technology, makes the internet as one of the media in learning (Erwan Sutarno, Mukhidin. 2013).

In the past teachers and students studied in class but now students use the internet to study in the classroom as well as outside the classroom. Blended Learning is a learning method that combines learning in the classroom and outside the classroom. Through Blended Learning learning students are expected to master the subject matter.

This study presents how to use and integrate technology in learning through the concept of blended learning and how the process of improving students' abilities and skills in mastering Basic Programming subject matter.

II. METHOD

The method used in this study was Class Room Action Research. This method is collaborative between teachers as researchers and researchers as observers. (Stephen, McTaggart, Robin Kemmis. 1988) This research was carried out because of problems in learning the mastery of Basic Programming Lessons in Vocational High Schools.

The instruments used in this study are as follows:

1. Observation sheet, a sheet containing activity data or things that are the focus of observation in this study. The activity observed was the activity of the teacher and students during the learning activities.
2. Questionnaire, a sheet that lists the questions that must be answered by the respondent. This questionnaire distribution aims to find out the use of Blended Learning in mastering the basic subjects of programming

3. Student Worksheets, worksheets created by the teacher to facilitate students in carrying out assignments that are equipped with material and work instructions on how to do or complete a problem / evaluation.

The procedure of research conducted in this study (Kemmis & McTaggart in Wardani (2001: 4.18) and was as follows:

1. Formulate problems and plan actions
2. Carry out actions and observations
3. Reflection (observation and learning outcomes)
4. Revision of re-planning.

The implementation of learning in classroom action research is carried out in two cycles.

III. RESULTS AND DISCUSSION

A. STUDENT PERFORMANCE BEFORE APPLICATION OF BLENDED LEARNING

Student learning outcomes in Basic Programming are still very low (Fig. 1)

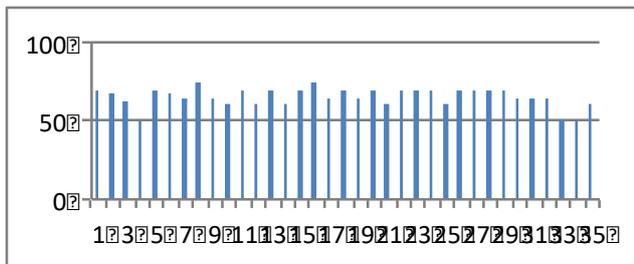


Fig. 1. Student learning outcomes

The average student learning outcomes in Basic Programming is 65.54 with the highest score of 75 and the lowest score is 50. Students who are considered to have finished learning in Basic Programming are students who obtain the same or more than the specified standard value of 75. thus students who there are only 2 students out of 35 students (5.71%).

B. IMPLEMENTATION OF BLENDED LEARNING IN BASIC PROGRAMMING SUBJECTS

Cycle I

Teacher has done learning according to the lesson plan that has been prepared. The teacher gives an explanation before students carry out learning using Blended Learning method, but it is less than optimal. The teacher in giving apperception is less clear, so there are still many students who are confused. Then the teacher explained again in detail until finally some students understood (Fig.2)



Fig.2. Teacher activity-cycle I

The teacher's attention is evenly distributed to each group of students but it is less intense to motivate students to express their ideas in implementing learning. There are still passive student activities in groups, where many students still rely on answers from friends who are considered smarter. Communication of students in groups is not optimal, because there are still groups who are ashamed to ask questions with their group members, so that they are still guided by the teacher (Fig. 3).

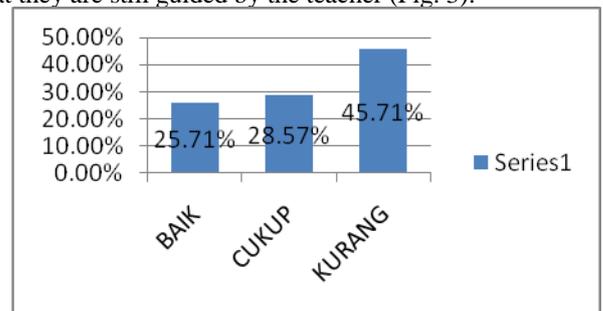


Fig. 3. Students activity – cycle I

The average value of student learning outcomes in basic programming learning is 72.40 with the highest value of 80 and the lowest value of 55. Students who are considered complete are students who obtain the same or more than the specified Standard value of 75. Thus in cycle I, students who have completed are 12 people out of 35 students (34.28%). This shows an increase in the ability of students from prasiklus (before the implementation of blended learning) to cycle 1 which is equal to 28.57% (Fig. 4.)

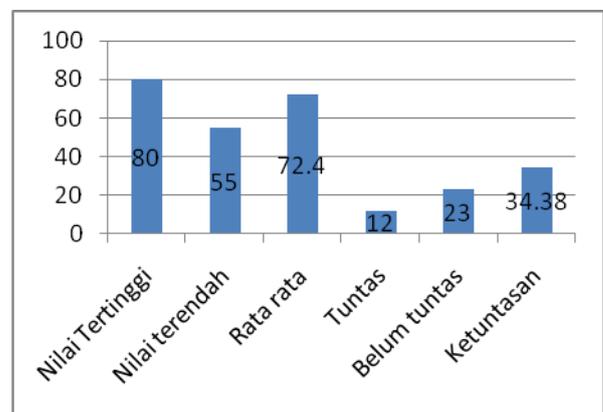


Fig. 4. Students learning outcomes – cycle I

Reflection on the implementation of learning in the first cycle is the need for improvement as follows: teacher

must convey the steps of implementing Blended Learning more maximally so that students do not experience confusion. In addition, teachers need to monitor maximally the activities of students in each group. Preparation and work attitude of students must also be considered in the second cycle.

Cycle II

The implementation of learning in cycle 2 has undergone many improvements, both in the activities of teachers, students and student learning outcomes. Teacher improvement in the process of learning activities is that the teacher conveyed the steps of implementing Blended Learning more maximally, so that students in each group did not experience confusion. Teacher gave students the opportunity and freedom to practice "nesting branching structures" based on Blended Learning that has been done before. Teacher activity shows in Fig.5.

During learning, students are monitored, guided and monitored maximally, so that students are excited, start active, and do not rely on answers from friends. Preparations and work attitudes are considered so that students are more neat, careful, and careful in carrying out learning practices. In addition students begin to collaborate with their friends in their respective groups (Fig.6).

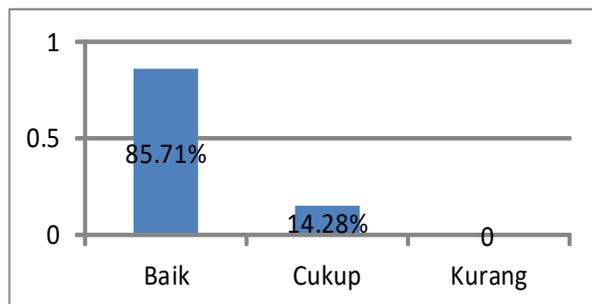


Fig.5. Teacher activity-cycle II

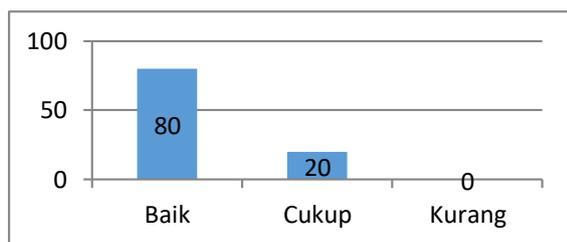


Fig.6. Student activity-cycle II

The average student learning outcomes in the second cycle is 80.43 with the highest score of 95 and the lowest value of 75 (Fig. 7). Students who are declared successful or complete (students who get the same or more grades than the standard value is 75) experience a significant increase of cycle 1 to cycle 2. Students who complete in cycle 2 are 35 students or 100%, while students who complete in cycle 1 are 12 out of 35 students (34.28%).

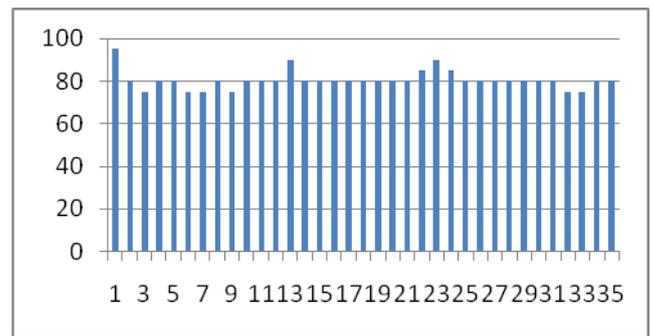


Fig. 7. Students learning outcomes – cycle II

The learning process in cycle I, the teacher has implemented the action in accordance with the learning plan that applies the Blended Learning method. However, there are some weaknesses and shortcomings that teachers do, namely: (1) When students do the exercises / Blended Learning in groups the teacher has not guided properly; (2) Guidance and monitoring are still lacking, so that students are still assisted by friends; (3) Preparation and work attitudes lack attention, teachers emphasize the work process and work results. This results in the assessment in one group not the same because there are still group members who only rely on their friends; (4) Material is only given in passing or in less detail; (5) Evaluation is still done in general; (6) The value of student learning outcomes in practicing the basic programming of "nesting branching structures" is still less satisfactory so that the process of improvement in cycle II is needed.

In the implementation of cycle II of learning, the teacher makes improvements based on reflection in cycle I. The teacher conveys the steps of Blended Learning more clearly. In carrying out the training / Blended Learning students are guided and monitored by the teacher based on the group so that the results are maximal. Preparation and work attitudes are more considered. The teacher always guides, motivates students and monitors learning. Students are involved in evaluating learning so that they know their weaknesses. Students are more active in learning and can work together in groups. The learning process is more focused and effective.

In addition, student learning outcomes have increased both from pre-cycle, cycle I and cycle II (Fig. 8)

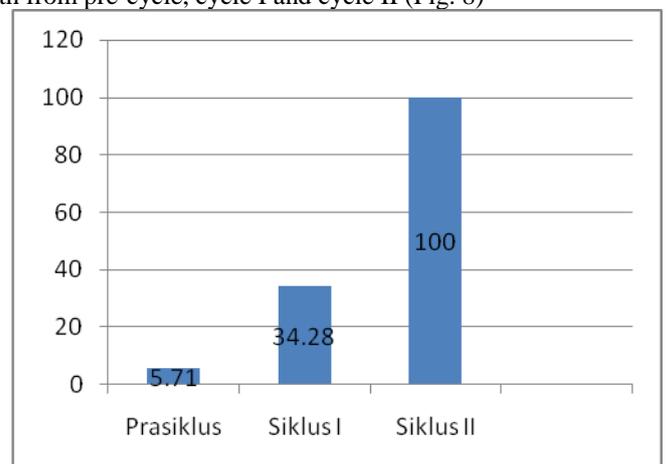


Fig. 8. Mastery learning of students

Application of Blended Learning is a new innovation because it uses the internet as a learning medium and is in accordance with the industry era 4.0 in the 21st century

(Randy Garrison. 2011). This was proven based on the results of research with the Action Research method on basic subjects at Cimahi Indonesia Vocational High School. (Mukhidin. 2017) as well as research carried out by Chang Zhu and Edmond [https://doi.org/10.1186/s41239-017-0043-4].

Action research class room for teacher is the right alternative choice to improve learning achievement and show an excellent improvement in learning achievement. this method is also implemented in elementary schools and shows significant learning outcomes and . Internet usage as a learning tool is a good thing and can help students to learn more actively (Erwan Sutarno, Mukhidin. 2013).

IV. CONCLUSIONS

The application of Blended Learning can improve students' learning abilities where the percentage of students who study thoroughly increases to 100% from the previous one which only reached 34%. In addition, blended learning can increase student activity in learning.

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