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Implementation of Blended Learning Methods to Improve the Ability and Learning Student Results in Basic Programming Subject

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***Abstract*—The implementation of Blended Learning model based on observations of learning activities on branching structure competencies Basic Programming subjects in class X RPL A has several constraints, such as teacher-centered learning process, lack of student activity in the implementation of learning activities, lack of openness and interaction between teachers-students and student interactions. This has an impact on the achievement of student learning outcomes that achieve the Minimum Passing Criteria (KKM) of only 5 of 35 students. The purpose of this study is to describe the profile of learning activities, so that from the results of the description the researcher can develop a learning improvement plan to improve student learning outcomes. The method used in this study is Classroom Action Research (CAR) conducted in two cycles and each cycle consists 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. The results of the study after action, observation and reflection obtained the number of active students in accordance with the field observations in cycle 1 of 34.28% (on a scale of 100); in cycle 2, 100% of all students who participated in learning activities were Blended Learning methods. Student learning outcomes in each cycle obtained an average value in cycle 1 of 72.4; in cycle 2 it was 80.43. With the number of students who get a value of ≥ 75 in cycle 1 as many as 12 students, in cycle 2 as many as 35 students. From the results of interviews with observers and students, learning the Blended Learning method is able to generate motivation, be more focused, directed in learning and more effective in take advantage of study time. Teacher-student and student interaction activities are more open so that student difficulties can be overcome. This shows that the actions taken during the implementation of the Blended Learning method learning model can increase the activity of student learning activities and student learning outcomes.**

Keywords—blended learning; basic programming subject; classroom action research

I. INTRODUCTION

The development of information and communication technology advances today is taking place so rapidly, that it is appropriate that experts call this phenomenon a revolution. Changes that will and are happening, mainly due to the potential and capabilities of information and communication technology that enable humans to relate to and meet their needs for almost unlimited information. Some of the limitations that humans experienced in dealing with each other, 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.

Today's rapid technological developments, especially in the field of Information and Integration of ICT-based learning model into one of the new learning in learning in the classroom is accessible [1].

The future trend of education in Indonesia is: first; the development of open education with distance learning mode. Second; sharing resources together between educational / training institutions in a network. Third; libraries and other educational instruments (teachers, laboratories) change functions into sources of information rather than just bookshelves. Fourth; the use of interactive information technology devices, multimedia, internet and social media in education has gradually replaced TV and Video.

Blended learning programs use many different forms of e-learning, perhaps complemented with instructor-led training and other live formats [2]. The interaction and participation offered in the best of traditional learning [3]. From both elements of the word can be seen that Blended Learning is a mixture of learning patterns. In the current technological era, almost all human activities need the help of sophisticated devices that can easily help their activities [4]. This certainly implies to educators and prospective educators to be able to apply the way of learning by utilizing the latest technology. This means that educators or prospective educators must be able and understand the technology so that they can carry out their duties properly in accordance with the applicable curriculum. Therefore, this study presents how to use and integrate technology in learning through the concept of blended learning. Further discussion about blended learning, will be discussed in this study.

Based on some of the descriptions above, the writer conducted a study entitled "Application of Blended Learning

Methods to Improve Students' Ability and Learning Outcomes in the selection material (PTK in Basic Programming Subjects in class X RPL A 2016-2017 Academic Year).

- Can the Blended Learning method improve students' abilities and skills in mastering the selection material for Basic Programming subjects?
- What is the process of improving students' abilities and skills in mastering the selection material in Basic Programming subjects?
- How big is the percentage increase in abilities and skills student in mastering the selection material Basic Programming subjects?

II. Research Methodology

The method used in this study was to conduct classroom action research, namely collaborative research between teachers as researchers and peers as observers. This research was carried out because of problems in learning mastery of branching structure material in Basic Programming subjects. There are still many students who practice monotonous, students are confused in reading installation drawings especially in practicing it, so research is needed to handle the material of the basic programming branching structure by applying the Blended Learning method so that students' ability in applying branching structures is better in accordance with the expected goals.:

A. Research Instruments

The instrument in this research are observation sheet and questionnaire. Observation sheet is a sheet containing activity data or things that should be the focus of observation in the activities in this study. This observation was carried out by an observer. The activities observed were the activities of the teacher and students during the learning activities. Questionnaire is a sheet that lists questions that must be answered according to the understanding given the questionnaire. The purpose of this questionnaire was to find out the use of Blended Learning method in handling the material Structure of Basic Programming Subjects for students. Student Worksheet (Job Sheet) That is a worksheet created by the teacher to make it easier for students to work on assignments because they are equipped with materials and work instructions on how to work on or solve problems / evaluations. That is photos of activities carried out during the learning process as proof of the implementation of research activities.

B. Procedure

The research procedure carried out was derived from the opinion [5] as follows.

- Formulate problems and plan actions.
- Carry out actions and observations (collaboration between educators)
- Reflection (observation and learning outcomes)
- Revised planning.

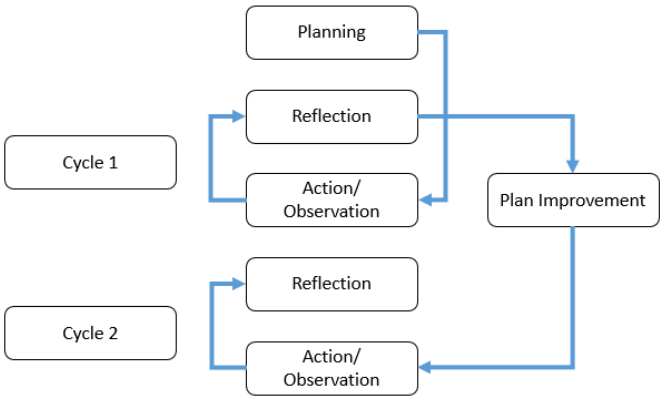

Fig. 1. Research cycle.

III. Results and Discussion

Before carrying out the action in this study researchers conducted pre-cycle activities, namely the learning of branching structure material in Basic Programming subjects. The results in the pre-cycle show that the data / value of the students' ability in the branching structure material of the Basic Programming subjects is very low. Pre-cycle activities can be presented in the figure 2.

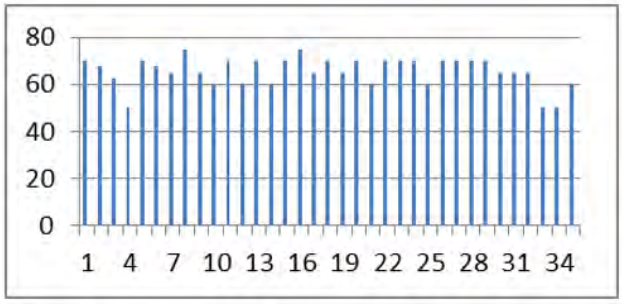

Fig. 2. Student learning outcomes data in practicing basic programming.

Based on the data in figure 2, it can be seen that the average score of students' abilities in Practicing Basic Programming is 65.54 with the highest score of 75 and the lowest score of 50. Students who are considered complete in the basic competencies of Practicing Basic Programming are students who get the same or more grades than the standards score is 75. So, students that has been completed there are only 2 people from 35 students or the percentage of completeness is only 5.71%. This fact illustrates that student learning outcomes or students' ability to practice Basic programming is very low or still concerning.

Then Observation Results (Observation and learning outcomes of cycle I) Observations and student learning outcomes are carried out jointly between researchers and observers. This observation includes teacher activities and student activities. Based on the results of observers' observations in cycle 1 learning, it was explained that the implementation of the learning process in practicing Basic Programming through the application of Blended Learning research was as follows:

- The teacher had done the learning according to the prepared RPP. The teacher gives an explanation of the explanation before the students carry out the practice with the Blended Learning method but less than the maximum.
- The teacher in giving apperception is less, so there are still many students who are confused. Then the teacher explained in detail the students finally understood even though not all.
- The teacher's attention was evenly distributed to each group but it was less intense to motivate students to put their ideas into practice. Student activity in the group there are still some students who are relaxed in group discussion.
- Students still rely on answers from friends who are considered smarter so that there are still some students who seem dreamy.
- Communication of students in groups is not yet optimal, because there are still groups who are ashamed ask questions with the group members, so the discussion is still a lot of guidance from the teacher. Regarding teacher and student activity data can be seen based on the presentation of the following tables and graphs. Presentation of the data in the table above if it is described in graphical form then looks like in figure 3 below.

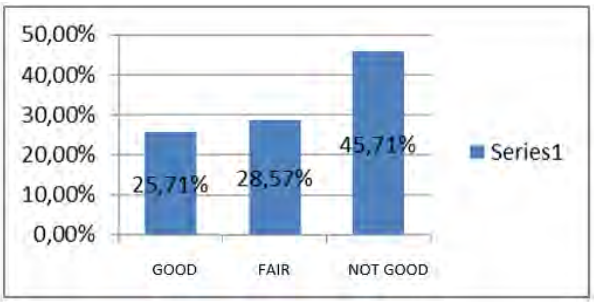

Fig. 3. Activity of teacher cycle activities 1 from student activities.

Activity data in cycle 1 in order to know the magnitude of students 'learning ability, in the learning process of the first cycle an evaluation of students' ability in the practice of branching structure "simple branching structure" is based on Blended Learning method, then the learning in cycle 1 is evaluated to determine the application of the method Blended Learning by students based on their group performance (figure 3). Data on student learning outcomes in the practice of programming branching structure Basic "nesting branching structure" after applying Blended Learning can be seen in figure 4 as follows:

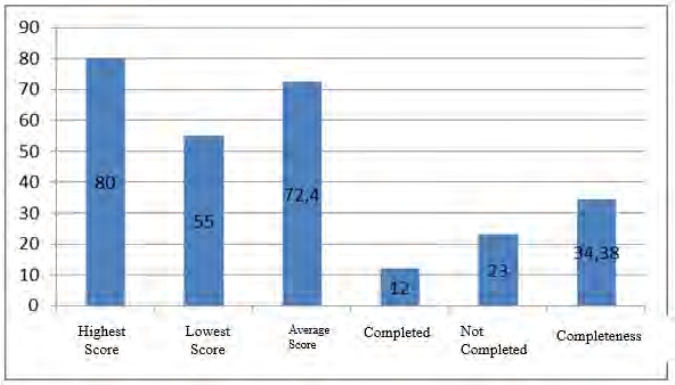

Fig. 4. Data on student learning outcomes in the practice of "simple branching structure" on cycle 1.

Based on the data analysis in figure 4, it can be seen that the average value of students' ability in the practice of "simple branching structure" in first cycle is 72.40 with the highest value of 80 and the lowest value of 55 that 2 people who completed in pre-cycle to 12 people in cycle 1.

Referring to the results of observations and the results of the evaluation of student learning above, it can be explained that blended learning value and attention student increase rapidly, but we have problem that not all of student get standard value and concentration to study. So, we have done second cycle. The result of second cycle can be seen in figure below.

Fig. 5. Teacher activity activity data in cycle 2.

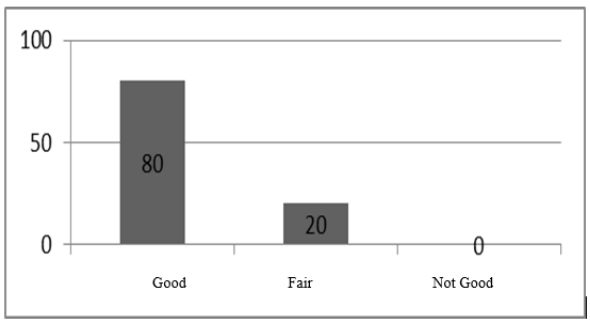

Fig. 6. Student activity data in cycle learning.

The result gets several improvements have been made from cycle 1 to cycle 2.

The data of student learning outcomes in practicing the basic programming of "nesting branching structures" with the Blended Learning method in Cycle 2, it can be seen from the data in figure 7 above, it can be seen the average value of

students' ability in Basic Programming practice" nesting branching structure "is 80.43 with the highest score of 95 and the lowest value of 75. Students which is declared successful or complete in the programming practice basic "nesting branching structure" that is students who get a score equal to or more than the value of the defined standard value is 75. Thus, in cycle 2 there is an increase in student learning outcomes that are quite significant or encouraging from cycle 1 to cycle 2. This is proven by students who are complete in cycle 2 as many as 35 students or 100% compared to cycle 1 which completed 12 students or 34.28% of 35 students. The percentage increase from cycle 1 to cycle 2 is 8.03%.

Based on the data in the programming process of learning the basic "nesting branching structure" by applying the Blended Learning method in cycle 2 can be described that all students feel happy and motivated to carry out practical activities. The atmosphere of learning feels more meaningful as students practice diligently and enthusiasm. Because of this Blended Learning method that has been applied by the teacher motivates students to work in practice independently, collaboration in groups, more directed, students already have the provision of experience and understanding when conducting Blended Learning training before programming practices Basic "nesting branching structures" independently in group. In addition, the teacher always motivates, guides, and monitors the practical activities carried out by students. In training evaluation (Blended Learning) and evaluation of student practices actively involved so that students know their weaknesses and weaknesses. Learning is concluded and reflected together between students and teachers. The benefits of Blended Learning methods can be felt, it is proven that students no longer rely on friends, but actively try themselves, collaboration in groups that look better, no more students who only see and holding practice tools. All students feel motivated to be able to prove the Blended Learning they follow to be applied in the Basic Programming practice of "nesting branching structures". Based on the data of learning outcomes of the practice of "nesting branching structures" in cycle 2 it can be stated that the students of class X RPL A of SMK 2 Cimahi already competent, has completed learning the practice of branching structures. In fact, the value of 35 people has been completed or above the KKM value. This shows that the acquisition of students' ability in basic programming practices has improved better. Thus, according to the results of the discussion between the author and the observer stated that the research carried out was very good. The description of the entire set of actions taken in this class action research can be described as follows.

- The learning process in cycle 1, the teacher / researcher has carried out the actions according to the steps of the activities written in the RPP or in accordance with activities that apply the Blended Learning method. However, there are some weaknesses and shortcomings that the teacher does, namely: When students do training / Blended Learning in groups the teacher has not monitored maximally. Guidance and monitoring are lacking so many students rely on friends. Preparations and work attitudes get less 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 friends. The material is only given in passing or in less detail. Evaluation less, because it is only evaluated in outline. The value of student learning outcomes in practicing basic programming "nesting branching structure" is still not satisfactory, because of the 35 students in class X RPL A, there were only 12 people complete, so the process of action improvement in cycle 2.

- The learning process in cycle 2, teachers make improvements based on reflection or findings about deficiencies in cycle I. These improvements include: The teacher conveyed the steps to implement training / Blended Learning more maximally. If you need to do individual guidance in each group, so no students are confused. In held Blended Learning students are guided and monitored by the teacher based on their groups so that the maximum results are: Preparation and work attitudes are more considered so that each student does not rely on friends because they are considered and directed. The teacher always guides, motivates students and monitors exercises (Blended Learning) to be applied to the practice of "nesting branching structures". Students are involved in evaluating training / Blended Learning so they know their weaknesses.

  Students are more active, independent, and a growing sense of cooperation between individuals in their groups to apply the Blended Learning method in carrying out the practice of "nesting branching structures"

  The learning process is more focused and effective. The results also proved to show a significant increase. This is evident in cycle 2 all students are able to practice Basic Programming "nesting branching structures" after the Blended Learning practices the basic programming of "simple branching structures". To be clearer, here is the presentation of student learning outcomes data in the form of students 'ability in practicing Basic Programming from Pre-cycle, Cycle 1 and Cycle 2. Class action assessments conducted in (2) two cycles with the aim of improving students' ability to practice programming the basis is in accordance with the criteria determined by applying the Blended Learning method. The learning process in cycle 1 still has many shortcomings by the teacher, so learning has not shown a good atmosphere and results. Learning causes students to remain confused, awkward, and feel unable to express their ideas and imagination in applying branching structures, so that the students' ability scores are less satisfying or still low. The cycle 1 activity ends with a reflection that aims to improve deficiencies so that plans and implementation are determined improvement in cycle 2. The purpose of this improvement so that the activities of the teaching and learning process create a comfortable, pleasant and meaningful learning atmosphere so that the value of learning outcomes increases from pre-cycle, cycle 1 to cycle 2. Data acquisition value of students' ability in applying branching structure from pre-cycle to cycle 1 to cycle 2 shows a very significant improvement,

increasing the ability and skills of students in practicing Basic Programming with the Blended Learning method already achieved. Increasing the average value of pre-cycle, cycle 1 and cycle 2. Increasing the ability of students to practice Basic Programming based on the comparison of the lowest and highest grades presented in figure 7 below.

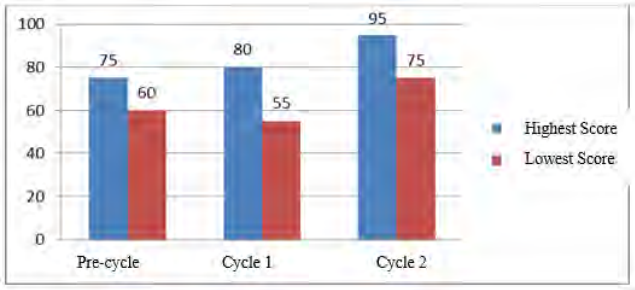

Fig. 7. The lowest and highest value data of students' ability to practice Basic Programming from the pre-cycle, cycle 1, 2.

Based on figure 7 above it can be explained that the highest score on the pre-cycle is 75, increasing in cycle 1 to 80 and increasing again to 95 in cycle 2. Facts this shows that the Blended Learning method is very appropriate and effective in learning to apply branching structures. In addition to the facts above it turns out that the application of the Blended Learning method can improve student learning completeness, as illustrated in the following figure.

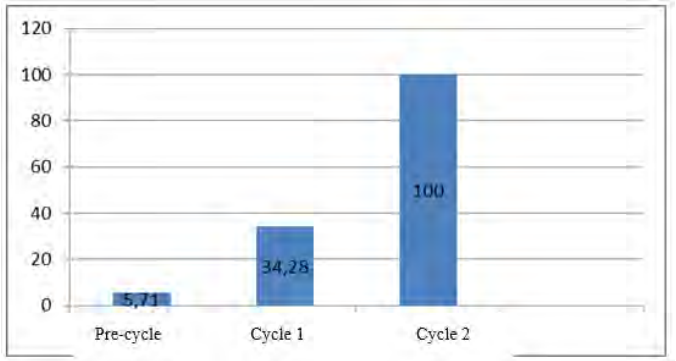

Fig. 8. Improvement of Students 'Learning Completeness Data in learning practiced pre-cycle, cycle 1, and 2

The cycles of programming on graph 10 showing that students' learning completeness significantly increased, which increased by 6.83% from pre-cycle to cycle 1, and by 8.03% from cycle 1 to cycle 2. In addition to the improvement in some of the above it turns out that Blended Learning methods can improve student learning activities. This can be seen in increasing student activity from cycle 1 to cycle 2. Active students increased from 9 people in cycle 1 to 28 people in cycle 2 or increased by 54.28%. Students who were less active in cycle 1 were originally 16, but in cycle 2 most were already active that is equal to 28 people the remaining 3 people are enough or competent category. Increasing student activity will ultimately improve the skills and abilities of students in learning to apply branching structure. Conclusion The results of research activities that have been done in class X RPL A regarding the application of Blended Learning methods in the learning of branching structure material in Basic Programming subjects shows that the results are very encouraging. The conclusions are outlined below.

- The application of the Blended Learning method can improve students' abilities in branching structure material in Basic Programming subjects. This can be seen from the student learning outcomes in the branching structure material in Basic Programming subjects before and after applying the Blended Learning method. The average score of students before applying the Blended Learning method is 65.57 increasing to 72.40 in cycle 1 and to 80.43 in cycle 2.
- The process of improving learning outcomes by applying Blended Learning method is as a means or alternative to learning so that understanding and activity students in the branching structure material Basic Programming subjects can increase. Students are no longer saturated, awkward or confused. Data increases student activity from cycle 1 to cycle 2, namely active students increase from 9 students to 28 students or by 54.28%. Students who are less active in cycle 1 all 16 students in cycle 2 have nothing less.
- Percentage of student learning outcomes in applying branching structures by applying Blended Learning method can be seen in the data of learning completeness from pre-cycle, cycle 1 and cycle 2 activities as following. Students who complete the material in the branching structure of Basic Programming subjects according to the KKM determined at 75 in the pre-cycle activity there are 2 students (5.71) increased to 12 students in the cycle 1 activity (34.28) and in cycle 2 students who complete it become 35 students (100%).

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