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The Effect of Discovery Learning Model Using Podcast Media to Improve Student Learning Outcomes

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ABSTRACT

Based on the results of observations made by the author at SMK Negeri 11 Bandung, in learning variables, constants, and data types there are still problems, namely students are less able to understand the material provided, causing them difficulty in creating programs. The purpose of this study is to improve learning outcomes by using the *discovery learning* model and podcast learning media. This research method uses pre-experiment type one group Pretest-Posttest. The results of this study were that 26 students (81.25%) experienced an increase in learning outcomes, 3 students (9.37%) had a fixed score, and 3 students (9.37%) experienced a decrease in learning outcomes.

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1. INTRODUCTION

Currently, we are in the era of the Industrial Revolution 4.0 where the use of technology is growing very rapidly. Various fields of work require technology to simplify work, and even some fields of work have used robots to replace human labor because it is considered cheaper, effective, and efficient (Partono, 2020), this can increase unemployment. In order for humans to be able to compete in the industrial world, it is necessary to be equipped with the ability to use technology.

Based on this, efforts to facilitate the ability to use technology can be made through the education sector. One way to equip students to use technology is through education at Vocational High Schools (SMK), especially in the Software and Game Development (PPLG) department. In this department, students are taught to create applications. To create applications, basic skills are needed, namely the skills to use variables, constants, and data types appropriately (Setyorini, 2020).

However, based on the results of the observations we made at SMK Negeri 11 Bandung, in learning variables, constants, and data types there is still a problem, namely students are less able to understand the material provided, causing them difficulty in creating programs. According to Mulyono & Agustin (2020) who examined the learning difficulties of students in basic programming subjects, there are students who get low learning outcomes in variable, constant, and data-type material. This is caused by several factors including 1) student intelligence, 2) teacher teaching methods, 3) media used, 4) learning environment, and 5) other factors. But of these five factors, the most influential is the learning method/strategy used by the teacher.

One of the models that can be used to improve student learning outcomes is Discovery Learning. Discovery learning encourage student to participate directly in learning activites by researching and finding what they might need (Asriningsih, Sujana, & Darmawati, 2021). In the research conducted by Rahmayani, Siswanto, & Budiman (2019) which examines the effect of the discovery learning model using video media on learning outcomes, the results of this study are the model and learning media used can improve student learning outcomes. Based on this research, learning models can be collaborated with learning media. Using audio visual media such as animation and audio recording has proven to improved student's experience and understanding in learning (Bala, Naharia & Nangoy, 2023).

In this research, discovery learning model will be utilized, along with a media in a form of podcasts. This research will be used to further prove the previous research by Oktaviyani & Ibrohim (2021) which examines the use of the discovery learning model using podcast media, to improve student learning outcomes.

2. METHODS

2.1. Research Design

The research design used was a pre-experiment of the one-group Pretest-Posttest type. The first step taken in this research design is to determine the research sample. The second step is that the sample is given a pretest (O_1). The third step is that the sample conducts learning activities (X). The last step is that the sample is given a post-test (O_2). The design of this study is shown in **Figure 1** below.

O_1	X	O_2

Figure 1. *One group pre-test post-test* design

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Description:

O_1 : Pre-test result
X : Treatment
O_2 : Post-test result

2.2 Population and Sample

The population in this study were grade X students of the SMK Department of Software and Game Development (PPLG). The sampling technique used is *probability sampling* type *purposive sampling*. The sample of this study is students who study the Basics of Software and Game Development (DPLG) subject matter of variables, data types, and constants. The sample of this research is SMK Class X students majoring in PPLG as many as 32 people.

2.3. Research Instruments

Research instruments are used in the data collection process to support the research to be carried out. The instruments used in this study are pre-test and post-test assessment instruments for the Basics of Software Development and Games.

2.4. Data Analysis Technique

The results of pre-test and post-test instruments were then processed using the gain test. The gain test is used to determine whether there is an increase in student learning outcomes before implementing learning and after implementing learning using the *discovery learning* model and podcast media. The classification of the gain test results is shown in **Table 1**.

Table 1. Classification of Gain Test Results

Gain Value	Criteria
G < 0.3	Low
0.3 ≤ G ≤ 0.7	Medium
G < 0.7	High

2.5. Research Implementation Procedure

This research is a Classroom Action Research (CAR) conducted in one cycle. The *CAR* cycle used can be seen in **Figure 2**.

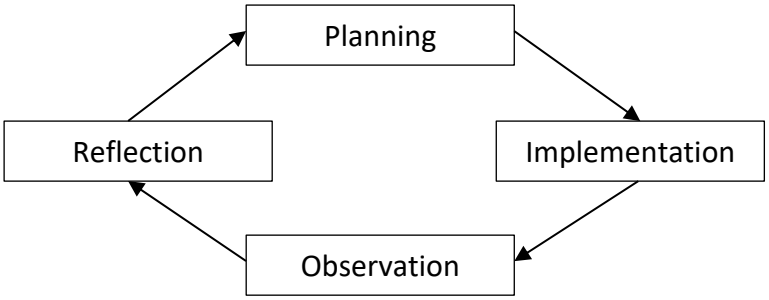

Figure 2. One Cycle Classroom Action Research

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The explanation of the class action research cycle in **Figure 2** is as follows:

2.5.1. Planning Stage

Developing a set of action that explains what, why, when, where, by whom, and how the action is carried out. In the class action planning stage, researchers prepared several documents for the implementation of this class action research. Researchers also plan the material to be taught, learning goals, plan the learning models and media to be used, and plan the research time. The following is the planning stage of class action implementation:

1. Prepare learning outcome documents.
2. Prepare teaching modules as guidelines for the learning process.
3. Prepare learning resources in the form of learning materials using podcast.
4. Develop pre-test and post-test assessment formats.
5. Develop student worksheet (LKPD).
6. Action planning in this study is based on the teaching module, namely by using the application of the discovery learning model.

2.5.2. Implementation Stage

At this stage, the teacher carries out the treatment, namely by carrying out learning activities which consist of three stages, namely:

2.5.2.1. Introduction Activity

1. The teacher prepares the class, says greetings, and checks students'attendance.
2. The teacher prepares the learning media to be used.
3. The teacher explains the learning objectives to be achieved in the learning activities.
4. The teacher motivates students to learn.
5. The teacher explains the learning techniques.

2.5.2.2. Core Activities

This core activity was carried out for 2 meetings, as follows:

1. First Meeting
   The learning materials presented were variables, data types, and constants.At the initial stage, the teacher gave a pretest to determine the initial ability of students and to determine grouping. After that, students are asked to sit ingroups to work on the LKPD that has been made. The teacher guided theLKPD work, and the results were presented by students.
2. Second Meeting
   In the second meeting, students were asked to create a simple programaccording to the example contained in the LKPD. Then asked to do a post-test assisted by Quizizz media with 20 multiple choice questions where the type ofquestion is the same as the pretest.

2.5.2.3. Closing Activities

1. The teacher evaluates the lesson that has been conducted.
2. The teacher reflects on the learning activities that have been done.
3. The teacher informs the students about the things that need to be prepared and done in the next meeting.

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4. The teacher conditions the learners before the teaching and learning activity ends, prays, and gives a closing greeting.

2.5.3. Observation Stage

In this observation activity, the teacher observes the results of using the *discovery learning* model and podcast learning media as measured by comparing the pre-test and post-test results.

2.5.4. Reflection Stage

Reflection activities are used to determine whether the research results are in accordance with the research objectives. If the results of the study are in accordance with the objectives then cycle II does not need to be done, while if it is not appropriate then cycle II must be done.

3. RESULTS AND DISCUSSION

3.1. Planning Stage

The results of the planning process that has been carried out are researchers making learning tools based on the curriculum which includes LKPD, pre-test and post-test questions, and learning reflection questions. In addition, researchers also prepare learning media. At this stage, the researcher has also determined the material to be taught, namely variables, data types, and constants. The learning model used is discovery learning. The learning media that researchers use are podcasts. Researchers also determined the research time, which was held in November at SMK Negeri 11 Bandung.

3.2. Implementation Stage

The results at the implementation stage, namely during the completion of the pre-test and post-test, are shown in **Table 2** below.

Table 2. Pre-test and Post-test Results

Test Type	Number of Students above minimum criteria (75)	Number of Students below minimum criteria (75)
Pre-test	3	29
Post-test	19	13

Based on **Table 2**, in the implementation of the pretest given to 32 students, the results are that there are 3 students getting scores above the set criteria of 75 and 29 students scored below the minimum criteria. Then students are given learning by using podcast media and the discovery learning model. After carrying out the learning, then students are asked to fill in the post-test questions and the results are that there are 19 students getting scores above the minimum criteria and 13 students still getting scores below the minimum criteria. Afterward, the pre-test and post-test results were analyzed using the gain test, the results are as in **Table 3** below.

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Table 3. Gain Test Results

Gain Value Criteria	Number of Students
High	2
Medium	19
Low	11

Based on **Table 3**, the results of the gain test conducted are that 2 students get a high category gain value, 19 students in the medium category, and 11 students in the lowcategory. Then the data on the improvement of learning outcomes based on the results of the gain test can be seen in **Table 4** below.

Table 4. Improvement in Learning Outcomes

Gain Value Criteria	Number of Students
Increased	26
Stay	3
Declining	3

Based on the results in **Table 4**, there were 29 students who experienced an increase in learning outcomes, 3 students who did not experience an increase, and as many as 3 students who experienced a decrease in learning outcomes.

3.3. Observation Stage

The results at the observation stage are that students experience an increase in learning outcomes seen in the pre-test and post-test results, in the pre-test there were only 3 students who were not satisfied with the results and got a score above the minimum criteria, then experienced an increase, namely there were 19 students who got a score above the minimum criteria. Then, based on the results of the gain test, 29 students experienced an increase in learning outcomes. The results of this observation indicates the learning model implemented and the learning media used have been able to improve student learning outcomes. Then in this observation, information was obtained regarding the cause of the decline in student learning outcomes, namely due to lack of accuracy in choosing the answer options provided.

3.4. Reflection Stage

At this stage, it is reviewed whether the research objectives have been achieved or not. In cycle I students looked more active and enthusiastic in learning. Learning completeness in cycle I is that there are 19 students (59.375%) who have completed and 13 students (40.625%) who have not completed. However, the results of pretest and post-test testing based on the results of the gain test have increased, namely, 26 students whose scores increased, 3 students whose scores remained, and 3 students whose scores decreased. From the results of the cycle I learning, shortcomings and difficulties have been successfully faced with a

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good plan. It can be concluded that the research objectives have been achieved and there is no need to do cycle II.

4. CONCLUSION

The results of this study were that 26 students (81.25%) experienced an increase in learning outcomes, 3 students (9.37%) had a fixed score, and 3 students (9.37%) experienced a decrease in learning outcomes. It can be concluded that the discovery learning model and podcast learning media used have been able to improve student learning outcomes.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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