

The Comparison of the Discovery Learning and Project Based Learning and their Influences to Student's Motivation to Learn Conditional Structure Programming.

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Abstract:

The research aims to know (1) the differences of the influence of discovery learning and project based learning combined with college ball model's influence to student's achievement in conditional structure programming; (2) the differences of learning interest influences to students' learning achievement; and (3) the effect of interaction between learning-model implementation and students' interest to students' learning achievement. The population of this research was students of class X MM in SMK N 6 Surakarta. The sample of this research contained the whole population include X MM 1 and X MM 2 class. This research used quasi experimental method posttest only control group design. Data were collected by questionnaire, for students learning interest data, and test for the data of students' learning achievement. Those data were analyzed with two-way Anova test with different content of cell, followed with double comparison of Scheffe's method with level of significance 0,05. The results showed that (1) there were no significance differences between discovery learning model and project based learning combined with college ball to students' learning achievement in conditional structure programming. The students taught with project based learning combined with college ball had no better significance learning achievement than those who were taught with discovery learning, although the score of the students who were taught with project based learning combined with college ball had better than those who were taught with discovery learning; (2) there were significance difference between learning interest to students' learning achievement. Students with high interest had better learning achievement than the students with low interest, but students with high interest had the same learning achievement as those with middle interest and students with middle interest and low interest did.; (3) there was no effect interaction between learning-model implementation and students' learning interest to their learning achievement.

Keywords: Discovery Learning, Project Based Learning, College Ball, Learning Interest, Learning Achievement

Introduction

Vocational graduates are required to master the skills that are expected to be ready to compete and excel print graduates qualified, skilled, competent in their fields and are also expected to create their own jobs. One of the important skills include programming. In the 2013 curriculum subjects basic programming with basic competencies that exist require learners to be able to make the program code by implementing three programs, namely the control of control branching, looping controls, and control jumping. Before learners acquire basic competency control application program, learners are given the material concepts of algorithms in the previous semester. In understanding these three functions are of course learners will understand if the three reinforcement material concept of the algorithm in the previous semester is still not understood optimally.

The conditions described earlier also occurs in SMK Negeri 6 Surakarta class X X MM MM 1 and 2, when the observation researchers conducted interviews with teachers who teach basic programming in odd semester class X Mother Yuliyani Siyamtingtyas, Kom., M.Cs on October 20, 2015. from hasi interview is concluded that the results of student learning in basic programming lessons from year to year tends to be low. Not much different is the case with students who are currently sitting in class X X MM MM 1 and 2, they have the same constraints in learning basic programming in odd semester of the 2015/2016 academic year. Learners who have problems in understanding the material concept of the algorithm caused by factors originating from within and factors that come from outside. One cause of the external factors are less suitably between the application of learning strategies with ability, motivation, and characteristics of learners. The model used for this study is the Discovery Learning. Based on the facts on the implementation of the model of discovery learning in class X X MM MM 1 and 2 are applied less effective in terms of time and the application is still too monotonous so no development to cultivate the students' enthusiasm. From these facts discovery applied models tend to be less suitable in the implementation of the basic programming learning is the practice of the majority of the material. Selection of learning strategy would be better to consider the factors that has been described above for the purpose of learning can be achieved, as well as instill in them to be more active in studying the concept of algorithm programming, with the formulation of a combination of models and appropriate learning strategies so that the classroom atmosphere becomes more fun. Currently pleasant classroom atmosphere is expected to understanding the concept of control branching learners can be absorbed optimally.

On this basis the competence of learning undertaken referring to the five scientific approach, the process includes activities 5M (observe, ask, explore, associate and communicate). A strategy that has the possibility in accordance with

understanding branching control structure is a model of Project Based Learning (PPA). Project Based Learning Model provides an opportunity to build a constructivist learners the knowledge and understanding of the concept of branching control by way of their own learning, and can produce a product. However, too much discussion without reinforcement theory also leads learners lack the understanding of the concept of control with good branching. Therefore we need a combination that can complement deficiencies learning model with each other. Learning techniques College Ball is one way to strengthen the understanding of the concept through repetition of material, by looping the material being taught is expected that learners can understand the concept of branching control easier and longer store the information in the memory of his memory. In addition to the factors derived from the model of applied learning, internal factors such as interest are also factors that determine the achievement of successful learning achievements of learners. According Ernawati (2010), students who took great interest in certain subjects will focus intensively on material which was which allows students to study harder and ultimately achieve the desired learning.

In connection with the background of the above problems, the researchers took the title of the thesis "Experimentation Discovery Learning and Project Based Learning College Ball Judging combination of Interests in Material Control Branching Class X Students of SMK Negeri 6 Surakarta Academic Year 2015/2016". The purpose of this study to find out:

1. The difference is significant between the application of learning models and models of Discovery Learning Project Based Learning College Ball combined techniques on the learning achievement of students in the control material branching SMK Negeri 6 Surakarta in following basic programming subjects Academic Year 2015/2016.

2. The significant differences between categories of interest on the learning achievement of students in the control material branching?
3. The difference between learning models and interests together on the learning achievement of students in the control material branching.

Research Method

Types of Research

This study uses a quantitative approach to this type of research is quasi-experimental research posttest only control group design.

Place and Time Research

The research takes place in SMK Negeri 6 Surakarta. It conducted from April 11 2016 to May 2, 2016.

Population and Sample Research

The sample in this study amounted to 64 students consisting of class X Multimedia 1 with the number of 32 students and class X Multimedia 2 with the number of 32 students. Samples from this study include the population of the study subjects. To obtain the necessary information in this study, samples were taken of class X Multimedia. The sample in this study consisted of two classes of class X Multimedia 1 (X MM 1) and multimedia class 2 (X MM 2) SMK Negeri 6 Surakarta 2015/2016 determined as an experimental group and control group randomly. So it can be determined that the class X Multimedia 1 as an experimental class and class X Multimedia 2 as the control class.

Data Collection Techniques

Data collection techniques used in this study is a questionnaire technique or questionnaire, learning achievement test, and documentation.

Data Analysis Techniques

Data analysis technique used in this study is a two-way analysis of variance. Prior to the data analysis prerequisite test analysis including normality test and homogeneity test.

Results and Discussion

Data Description

Based on the prior knowledge of students, from the calculation of the data using SPSS version 17 bantuam has an average value (mean) of 48.9 to 49.5 for the experimental class and control class. The results of t test analysis showed that both variants of the experimental class (X MM 1) and the control class (X MM 2) identical or have the same initial capability / balanced.

Data from the instrument test result analysis test items with a total of 21 items were used and four items that are not used. As for the test results obtained 17 item questionnaire instrument used questionnaire and 9 item questionnaire that is not used. Data on learner preferences obtained by questionnaire, which were then grouped into three categories: high, medium, and low. This grouping is based on the average value of the ideal (MI) and the standard deviation of the ideal (SDI). By using these criteria there are 20 students who have high interest, 30 students have an interest in being, and 14 students with low interest. Data learners by teaching Project Based Learning model with a combination College Ball to the basic competence branching control showed an average of 81.81 with a standard deviation of 7.333. The lowest and highest value obtained by students in the experimental class is 68 and 96, and a large variance 53.770. The data obtained in the control group showed that the average value of 76.06 with a standard deviation of 10.995. The lowest value and ultimate control of students in a class is 54 and 98 with a large variance of 120.889.

Hypothetical Test Results

Hypotheses to be tested are as follows:

- *H1A*: There are differences in the effect of learning achievement between using the model of Discovery Learning and Project Based Learning models use a combination College Ball.
- *H1B*: There are differences in the effect of interest categories to achievement of learners.
- *H1AB*: There are differences in the effect of the interaction models and interests collectively equal to the learning achievement of learners.

Hypothetical Testing used two-way analysis of variance with the results as shown in Table 1.

Table 1. Result of Variance Analysis Two Directions

Variable	Sig	Criteria	decision
Model (A)	0,38	6 0,386>0,05	Ho accepted
Interest (B)	0,00 6	0,006<0,05	Ho rejected
Interaction (AB)	0,053	0,053>0,05	Ho accepted

The first hypothesis test results can be seen that the result shows great sig *Fhitung* is 0.386. Test criteria when Sig *Fhitung* > 0.05 then Ho is accepted, this means that there is no difference between the effects of the use of models of Discovery Learning and Project Based Learning models use a combination College Ball.

There were no differences between the effects of the application of the model applied to the learning achievement of learners. Nevertheless, the experimental class learning achievement results attained were higher than the control class. Observations were found in the experimental class during a lesson College Ball several groups dominated by someone, so that led to some students tend to be passive and rely on the group. Interaction with other students in the group during the learning College Ball held also less than the maximum. In the current reality of research, students have limited time while completing the tasks given, whereas the model Project Based Learning is designed with a profit increase of constructivism students working on projects there.

The second hypothesis resulted in the decision that there are different categories of interest influence on the learning achievement of learners. Summary of two-way analysis of variance is more clearly shown in Table 1, the analysis shows that a large $F = 5.520$ with Sig. = 0.006 (<0.05) then *HOB* rejected, it means that there is a difference between the interests of learners categories of high, medium and low on academic achievement. *HOB* rejected because it would require post-ANOVA test is test Scheffe Post Hoc test.

Table 2. Result of Scheffe Test

Category	value Sig
High – Medium	0.252
Medium – Low	0.165
High - Low	0.010

Scheffe test results obtained that there are significant differences between the steeper interest and low interest towards learning achievement of learners and there was no significant difference between high interest with the interest being and interests moderately lower interest on the learning achievement of learners. Based on observations of the learning takes place when students with high interest tends to predominate when learning takes place. Students with high interest active when both learning the experimental class and control so that the results of student achievement with higher interest higher than students with low interest.

The third hypothesis to be tested is "There is a difference of influence models and interests together towards the achievement of learners ". From the data obtained from treatment in terms of the types of

models are applied and the interest categories learners will be analyzed both variables influence the learning achievement of learners. Summary of test results can be seen in Table 1 Test Results Hypothesis. The analysis showed that a large $F = 3.091$ with $\text{Sig.} = 0.053 (> 0.05)$ then H_0 accepted, this means that there is no difference between the interest and the model of learning achievement of learners. H_0 accepted because it does not require post-ANOVA test. Learners with a high level of interest there is a tendency to get the achievement learn better by using a model of learning in both Discovery Learning and Project Based Learning combination College Ball, it also happens to interest categories moderate and low, no inclination to get learning achievement better with implementation of both learning model Discovery learning and Project Based learning combination College Ball. Learners with high interest in each of the experimental class and the control class has always dominated, they are always active when both learning in the classroom with the application of the Discovery Learning and the class with the implementation of Project Based Learning combination College Ball.

Conclusions and Recommendations

Conclusions

Based on the discussion that has been described previously, it could be concluded as follows:

1. There were no significant differences between the positive and the application of the model and the model of Discovery Learning and Project Based Learning combined with the College Ball to the achievements of learners.
2. Learners with high interest categories have better learning achievement than students with low interest category. Each category has an average improvement in learning achievement are different for high and low interest categories differ significantly and significant. As for the average improvement in learning achievements of learners of high category and there was no difference in the average significantly, as well as medium and low categories.
3. Between the interaction of interests of learners and the learning model does not provide a positive and significant effect on learning achievement of learners.

Suggestions

Based on the discussion and conclusions above, it can put forward the following suggestions:

1. For Teachers, learning by discovery learning materials and teachers should consider appropriate strategies for implementation. Content that is practical should be developed by taking into account the strengthening of the theoretical, because basically the material taught in class X was too new to be known to the students in class X which previously was new to know the material. We recommend that teachers can be a good facilitator so that learners can be directed when learning activities.
2. For Schools, With the research that has been done of the school is expected to provide policy and facilities for teachers to develop a wide choice of models to learn because the learning will take place effectively and efficiently when all parties work together to improve the quality of education.
3. For researchers, the limitations in this study if seen from the results of their study, the researchers used only the cognitive value to determine the achievement of affective and psychomotor belajar. Sedangkan value processed by the teacher. Other factors that influence achievement learn a lot, while in this study involves only the model variables and interests. To the researchers can further include other variables that have not been included in this study.

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