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Effect of Project Based Learning Method on Knowledge and Learning Activity in Graduate School Students

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ABSTRACT

Background: The Project Based Learning (PjBL) model is a learning model that can make students have expertise and can understand the learning process. This study aims to look at the application of Project Based Learning (PjBL) to increase student activity, to see the character values and results of student academic achievement in the KKPMT practice subject to achieve competence.
Subjects and Method: RCT research was conducted at STIKes Mitra Husada Karanganyar. The sample consisted of 90 students, 48 students as the control class and 42 students as the experimental class. Student activity is assessed with an observation sheet. Student character is assessed by means of a questionnaire. The results of learning achievement using the posttest and pretest instruments. The mean knowledge scores in both groups were compared by independent t-test.
Results: The knowledge score after the intervention in the project-based learning group (Mean= 71.81; SD= 8.35) was higher than that of the control group (Mean= 67.73; SD= 8.64), and was statistically significant (p= 0.026). Project-based learning is effective in increasing students' knowledge of ICD. The activity score after the intervention in the project-based learning group (Mean= 68.83; SD= 12.87) was the same as the control group (Mean= 68.27; SD= 11.53), but statistically not significant (p= 0.827).
Conclusion: This study concluded that project-based learning was effective in increasing students' knowledge of ICD but project-based learning was not effective in increasing student activity in discussing ICD subjects.

Keywords: project based learning, student character, student activity, learning outcomes

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BACKGROUND

Coding Classification of Diseases and Medical Procedures (ICD) is part of the Classification and Coding of Diseases and Health Problems and Actions (KKPMT) course. This course is a science that studies the Disease Classification system and procedures used for coding diagnoses and medical procedures, as a basis for skills in carrying out codification as a representation of clinical

data from medical record documents of patients treated in health care facilities within a certain period. The KKPMT course must go through direct practice because it is a basic competency so that during the Pandemic students had difficulty learning online. Many students do not understand how to apply knowledge when students are faced with practice in health care facilities. So that with the Project Based Learning method, students are expected to be able to think critically and lecturers are expected to be able to make learning concepts easy for students to understand during an online pandemic (Anggraini, 2017).

Project Based Learning is a model that can organize projects in learning (Gullbahar, 2006). Project based learning is a learning model that uses projects which provide opportunities for more collaborative student-centered learning systems, students can be actively involved in completing projects independently and in collaboration with groups. Lasonan and Vesterinen (2000) also found 78% of students said a project-based learning curriculum could help equip students to prepare for entering the world of work, because students learn not only in theory but in practice.

Vocational education is still very difficult to carry out PjBL learning for KKPMT practice courses because it is skill-oriented according to scientific and applied developments with the demands of needs in the workforce. The vocational education study program is expected to produce graduates who have the ability to work in certain fields according to the needs of government institutions and health services. The teaching and learning process at the D3 Medical Record and Health Information Study Program STIKes Mitra Husada Karanganyar for the KKPMT Practice course has not implemented Project Based Learning (PjBL). To achieve the competence of student activity during learning is very important. A boring learning process can make students pay less attention to learning and students tend to be passive. Therefore we need a fun learning method to find out the characteristics of students, increase activity and learning outcomes in order to achieve competence.

Based on the background of the problem, this research can identify problems with the learning methods in the Practice course used by lecturers at this time, which are still limited to general knowledge without using project-based learning methods. Students in achieving grades experience a decrease during KKPMT practice with online learning thereby reducing character values and academic achievement which results in students not achieving competency. The Project Based Learning (PjBL) model is a learning model that can make students have expertise and can understand the learning process. This study aims to see the application of Project Based Learning (PjBL) to improve student academic achievement and to find out student perceptions of online KKPMT practice courses during the Covid-19 pandemic to achieve competence.

SUBJECTS AND METHOD

1. Study Design

The research design in this study used the Pretest-Posttest Control Group design. The quasi experimental design has an experimental class and a control class, but the control class cannot fully function to control external variables that affect the implementation of the experiment. This research was conducted on December 2022 to March 2023 STIKes Mitra Husada Karanganyar.

2. Population and Sample

The population in this study is all students in semester five in the D3 Medical Record and Health Information Study Program totaling 90 students. The sample amounted to 90 students from Class seven A as a control class

totaling 48 and Class seven B as an experimental class totaling 42 students.

3. Variable Study

Dependent variables: Activeness, character value, learning achievement KKPMT Practice for D3 Study Program Students Medical Records, Health Information fifth semester.

Independent Variable: Project Based Learning model.

4. Operational Definition of Variables

Project Based Learning (PjBL): a learning process that involves work projects in it which are carried out individually or in groups (Suriyadi, 2018). Students are given the freedom to plan learning activities and play an active role in the learning process. Implementation of learning has stages of determining fundamental questions, designing plans, compiling schedules, monitoring students and project progress, testing results, and evaluating.

Active student learning is a teaching and learning process that emphasizes the physical, mental, intellectual and emotional activity of students in order to obtain learning outcomes in the form of a combination of cognitive, affective and psychomotor aspects while students are in class (Wlipple in Hamalik, 2009). Student activity was assessed using an observation sheet on student activity at each meeting using an interval scale.

The Value of Character Education it self is a process of learning knowledge, skills and human habits that are passed down from one generation to the next. Character is the accumulation of personality, character, and individual traits that direct the habits and beliefs of these individuals in living their daily lives. By using a questionnaire and a scale of measurement using an interval scale.

Learning achievement is the result of measuring students which includes cognitive, affective, and psychomotor factors after participating in the learning process which is measured using relevant test instruments or instruments. Student learning achievement data consists of posttest and pretest data. Variable scale using intervals.

5. Instrument

The test instrument in this study was a set of evaluation tools in the form of 60 pretest questions and 60 posttest questions. Items are made in the form of multiple choices which are focused on mastery of the material. The test questions are arranged based on the grid. The pretest and posttest are used to measure the extent to which students' mastery of the KKPMT learning material is delivered using the Project Based Learning (PjBL) method. The test is in the form of multiple choice questions based on indicators, competency standards and basic competencies.

The research instrument for measuring activeness variables is carried out by observing activities during the learning process. To measure student character variables, it is done by assessing aspects of creativity, curiosity, responsibility, friendship, thoroughness during the discussion. Meanwhile, to obtain data regarding learning achievement is done by posttest and pretest.

6. Data Analysis

This study use independent t test to see the character values and results of student academic achievement in the KKPMT practice subject to achieve competence.

7. Research Ethics

This study has passed the research protocol review process and obtained a Certificate of Passing Ethical with No: 101.1/059/STIKES-mhk/II/2023.

RESULTS

1. Characteristics of Students

Table 1 shows that the average age is 21 years. Table 2 shows that the majority are women (83.33%).

Project Based Learning model for student achievement

The pretest was conducted to find out students' initial knowledge in working on case questions related to learning before being exposed to the Project Based Learning model. At the end of the lesson, students are given a posttest to determine learning outcomes after the Project Based Learning model.

Table 1 Characteristics of the sample in age

Variable	Frequency (n)	Mean	SD	Min.	Max.
Age (year)	90	20.84	0.92	19	25

Table 2 Characteristics of the sample in terms of gender

Variable	Frequency (n)	Persen (%)
Male	15	16.67
Female	75	83.33

Table 3. Scores of knowledge about the international classification of diseases (ICD) before implementing project-based learning, between the experimental group and the control group

Treatment Status	N	Mean	SD	t	p
Project-based learning	42	61.02	10.11	-0.98	0.329
Control	48	58.69	12.21		

Table 4. Scores of knowledge about the international classification of diseases (ICD) after the implementation of project-based learning, between the experimental group and the control group

Treatment Status	N	Mean	SD	t	p
Project-based learning	42	71.81	8.35	-2.27	0.026
Control	48	67.73	8.64		

Table 3 shows that the prior intervention knowledge score in the project-based learning group (Mean= 61.02; SD= 10.11) is slightly higher than the control group (Mean = 58.69; SD=12.21), and is not statistically significant (p= 0.329). Thus the two groups showed comparable knowledge scores before the intervention.

Table 4 shows that the knowledge score after the intervention in the project-based learning group (Mean = 71.81; SD = 8.35) is higher than the control group (Mean = 67.73; SD = 8.64), and is statistically significant (p = 0.026). It was concluded that project-based learning was effective in increasing students' knowledge of ICD.

Table 5 Scores of activeness regarding the international classification of diseases (ICD) before the implementation of project-based learning, between the experimental group and the control group.

Treatment Status	N	Mean	SD	t	p
Project-based learning	42	66.69	12.44	-0.01	0.999
Control	48	66.68	11.97		

The use of the Project Based Learning learning model for student activity

In this study, observation sheets were used to assess student activity using a scoring rubric where each of the indicators assessed had a score from one to four. Sub-variables for assessing student activity are visual activities

(including paying attention to lecturers, observing experiments carried out, observing material slides from lecturers, observing demonstrations carried out by lecturers), verbal activities (including willingness to ask questions, willingness to answer, express opinions, discuss with friends), listening activities (including listening to lecturer orders/ directions, listening to subject matter, listening to group discussions, listening to friends' explanations), writing activities (including taking notes on practicum materials, doing assignments, making summaries and conclusions, recording group work results), metrical activities (including conducting experiments with practicum groups, preparing practicum tools, using practicum tools properly and correctly, cleaning up tools after completing practicum).

Table 6 Scores of active learning about the international classification of diseases (ICD) after the implementation of project-based learning, between the experimental group and the control group

Treatment Status	N	Mean	SD	t	p
Project-based learning	42	68.83	12.87	-0.22	0.827
Control	48	68.27	11.53		

To find out student activities during the practicum process for the KKPMT course, observation sheets were used in the experimental class of 42 students and the control class of 48 students in two meetings. In collecting data to make it easier and more objective, the researchers conducted an assessment using observation sheets with the help of observers, namely 5 people for each observer observing 8 students.

Table 5 shows that the score of activity before the intervention in the project-based learning group (Mean= 66.69; SD= 12.44) is the same as the control group (Mean= 66.68; SD= 11.97), and is not statistically significant (p= 0.999). Thus the two groups showed comparable activity scores before the intervention.

Table 6 shows that the score of activity after the intervention in the project-based learning group (Mean= 68.83; SD= 12.87) is the same as the control group (Mean= 68.27; SD= 11.53), and is not statistically significant (p= 0.827). It was concluded that project-based learning was not effective for increasing student activity in discussing ICD subjects.

DISCUSSION

The effect of using the Project Based Learning learning model on student achievement.

Before being given the project-based learning model treatment, the average knowledge score of students in the intervention group was slightly higher than the control group, but not statistically significant. This shows that the knowledge scores in the two groups are comparable.

After the intervention, the average knowledge score in the experimental group with the project-based learning method was higher than the control group and statistically significant. This shows that project-based learning is able to increase student knowledge scores.

Learning outcomes will appear in every change in aspects of human behavior. The aspects include knowledge, understanding, habits, skills, appreciation, emotional, social relations, physical, ethical or manners and attitudes. In the learning model using the project-based learning method, the pretest and posttest questions are given as many as 60 multiple choice questions related to the material that has been taught, namely KKPMT.

Sadia (2013) stated that the project-based learning model is able to provide better understanding of concepts and learning outcomes compared to conventional learning models. The project-based learning model is a method that uses contextual learning, where students play an active role in solving problems, making decisions, researching, presenting and creating documents.

A study by Utami (2019) showed that (1) there was a significant difference between the post-test results of the experimental class and the control class (2) there was a significant difference in student activity between the control class and the experimental class. So it can be concluded that there is a significant influence of the project based learning learning model on student learning outcomes and activeness.

A study by Rais (2010) showed that (1) the PBL model developed contains learning materials, learning scenarios, PBL model learning guides, and student worksheet formats that have met the acceptance criteria, which include aspects: usability, accuracy and feasibility and (2) there are differences in the average pretest and posttest scores for machine design knowledge. The average pretest score was 62.3 and the posttest score was 81.58. The difference in the average score indicates a significant increase in student academic achievement.

The use of the Project Based Learning learning model for active learning in students.

The activeness score after applying the Project Based Learning learning model in the intervention group (Mean= 68.83; SD= 12.87) was comparable to the control group (Mean= 68.27; SD= 11.53), with a p= 0.827. This means that project-based learning is not effective for increasing student activity in discussing ICD subjects.

This can be proven from the results of the observation sheet scores which show that the results of the analysis show that there is no difference in student activity before using the project-based learning model and after using the PjBL learning model. Students are divided into small groups to discuss and solve problems regarding the kkpmt practicum, each student in the group is given a project worksheet and students work on the projects that have been prepared. After the project has been completed, each group presents its results by presenting them and other groups can provide input and solutions to any problems that occur in each case to other groups. Each member of the group gives opinions and solves problems together so that there are no students who are not active in kkpmt practicum activities.

Achmad (2011) states that learning is an important process for changing everyone's behavior and that learning includes everything that a person thinks and does. So in addition to the learning model used, a teacher's ability is needed to provide strong encouragement so that students' own initiative emerges to learn without any coercion.

An observations by Hutapea (2016) in the experimental class showed student activity in the very active category. They had very good skills. Changes in attitude in the experimental class were in the very good category while the attitudes of students in the control class were in the sufficient category. The results of using the hypothesis test obtained the conclusion that there is a significant influence on the application of the project-based learning model on student physics learning outcomes. In other words, the use of the project-based learning model has better learning outcomes than conventional learning.

AUTHOR CONTRIBUTION

Yuyun Manggandhi as the principal researcher, formulates problems, collects data,

analyzes data, interprets and concludes research results. Eti Poncorini Pamungkasari and Setyo Sri Raharjo discuss the content of the article.

CONFLICT OF INTEREST

There was no conflict of interest in the study.

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