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CORELATION OF CRITICAL THINKING ABILITY TO LEARNING ACTIVITY AFTER FLIPPED CLASSROOM-PjBL LEARNING MODEL APPLICATION

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Abstract

This study aimed to determine the correlation of critical thinking skills with learning activities after the application of the flipped classroom-PjBL learning model. The sample used in this study were students who took the assessment of the process and learning outcomes of chemistry class C in the 2022/2023 academic year of the Jambi University Chemical Education Study Program. The research method used is the correlation method with a quantitative approach. Research data were obtained using a questionnaire before and after the application of the flipped classroom-PjBL learning model to data on critical thinking skills and student learning activities. The questionnaire on critical thinking consists of 5 statements, while the questionnaire on learning activity consists of 10 statements. Data regarding critical thinking skills and learning activities were carried out Pearson correlation test to determine the relationship between the dependent variables, the correlation level of critical thinking skills and learning activities was carried out product-moment correlation test. The results of this study are that there is a very good correlation between students' critical thinking skills and learning activities after the application of the flipped classroom-PjBL learning model, the correlation level of critical thinking skills to learning activities is very high with a value of 0.813.

Keywords: Correlation, Critical thinking, Learning activity, Flipped classroom, PjBL

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INTRODUCTION

Education plays a role in shaping a person's character. The purpose of implementing education is to create human resources with personality, responsibility, morals, knowledge and skills (Ritonga, 2018). The implementation of the curriculum as a standard for implementing education in Indonesia must be adjusted to the needs and changes of the times, so it changes every few years. The application of the curriculum as an educational standard is adjusted to the needs and conditions being faced, so the curriculum must always develop (Hendra et al., 2023). The government, especially The Ministry of Education, Culture, Research, and Technology, provides 4C skills as an effort to increase student competence.

4C skills include critical thinking, collaboration, communication, and creativity. Learning activities will become meaningful if learning is student-centered. Problems encountered by students in learning will make students' critical thinking skills increase because students are required to find solutions to the problems they face. The ability to think critically directs a person to a deep and thorough thinking in solving problems encountered (Muttaqiin & Sopandi, 2015) A person's critical thinking ability can be seen from the ability to clarify a problem, convey an explanation (Nuryanti et al., 2018).

Student-centered learning activities, in addition to improving critical thinking skills, can also increase student learning activities. A person's learning activity is seen from the ability to read material, pay attention to the delivery of material, ask and answer questions, discuss and listen to opinions in discussions (Ekaputra & Hasanah, 2021).

Based on observations made by several semester six students of the Chemistry Education Study Program at Jambi University is that the learning activities implemented have not facilitated students in improving their critical thinking skills and learning activities. Activities are still often carried out in one direction, so that learning becomes passive, students tend to memorize subject matter to face exams so that learning becomes less meaningful. The effort made by researchers to improve the quality of learning is to apply a learning model. The model to be applied is focused on the PjBL model which is integrated with the flipped classroom model.

The PjBL model facilitates students to convey ideas and make a product in learning from the project given (Utami et al., 2018). The PjBL model involves students in completing projects given in learning, so that students' abilities will increase (Apriany et al., 2020). Flipped classroom is a learning model that facilitates students to study lecture material at home according to the learning speed and material understanding of each student. Flipped classroom applies learning activities that should be done face-to-face in the classroom to be at home or done in reverse (Rahmadani et al., 2022). The positive impact of applying the flipped model is that students are given provisions in advance before learning activities in the classroom (Agustina & Naphiah, 2021).

The application of the flipped classroom model combined with the PjBL model. This is in line with (Kamaruddin et al., 2022) who stated that combining the flipped classroom model with PjBL is an innovative activity to make learning more meaningful because it can activate students and improve critical thinking skills and understanding of material. The PjBL model that is integrated with the flipped classroom encourages students to collaborate more in completing tasks.

Based on this background, the research problem is focused on examining the correlation of critical thinking skills to learning activities after the application of the flipped classroom-PjBL learning model.

METHOD

Research Design

This type of research is experimental research with a one-group pretest-posttest design.

Research Sample

The samples used in this study were 20 students who attended the assessment of chemical learning processes and outcomes in class C of the Jambi University Chemical Education Study Program in the 2022/2023 academic year. The independent variables used in this study are the flipped classroom-PjBL learning model and the dependent variables in this study are critical thinking skills and student learning activities.

Data Collection Technique

The technique in collecting data in this study used a questionnaire to obtain data on the ability to think critically and learning activities of students who attended the lecture on the assessment of the process and learning outcomes of chemistry which was given the application of the flipped classroom-PjBL model. Pearson correlation test was conducted to test the hypothesis in this study. The existence of a correlation between critical thinking skills and learning activities is indicated by significant results less than 0.05. The magnitude of the correlation between critical thinking skills and learning activities can be seen in Table 1.

Table 1. Correlation level

Magnitude of r product moment	Relationship Level
0,000 – 0,200	Very Low
0,601 – 0,400	Low
0,601 – 0,600	Moderate
0,601 – 0,800	High
0,801 – 1,000	Very High

RESULTS AND DISCUSSION

This study aims to determine the correlation of critical thinking skills to learning activities after the application of the flipped classroom-PjBL learning model. Before applying the flipped classroom-PjBL learning model, students were asked to fill out a questionnaire regarding critical thinking skills and learning activities and obtained students' initial critical thinking skills of 69.5 while initial learning activities amounted to 68.7.

Learning activities by applying the flipped classroom-PjBL model were carried out four times a meeting. Students are given material about assessing the learning process and evaluating learning at home as discussion material in classroom learning, students are also given projects in the form of developing learning assessment instruments and validating previously developed instruments. In learning with the application of the flipped classroom-PjBL model, students are more active in discussion activities. The occurrence of increased student learning activities in lecture activities is due to the flipped classroom model that is applied, being able to provide opportunities for students to study lecture material that will be discussed independently at home. Giving projects in the form of making learning assessment instruments and validating instruments makes students' critical thinking skills increase because students are required to make instruments that are able to evaluate learning activities as a whole. The application of the flipped classroom-PjBL model in learning activities can increase student interest (Ekaputra & Sanova, 2023). The flipped classroom model applied in learning activities is able to provide accommodation for differences in ability to learn the material to students (Chandra & Nugroho, 2016). The flipped classroom model provides opportunities for students to study material before face-to-face learning takes place (Hasanudin & Fitrianingsih, 2019).

After the application of the flipped classroom-PjBL learning model, there was an increase in critical thinking skills by 14.1 from 69.5 to 83.6 while the increase in student learning activities by 16.8 from 68.7 to 85.5. The results of critical thinking skills and learning activities before and after the application of the flipped classroom-PjBL model are presented in Table 2.

Table 2. Results of critical thinking ability and learning activity

Variable	Beginning	End	Gain Skor
Critical Thinking	69.5	83.6	14.1
Learning Activity	68.7	85.5	16.8

Pearson correlation test is conducted to determine the correlation of critical thinking ability variables to learning activities. Based on the results of the person correlation test, the significance value is 0.02 or less than 0.05. These results indicate a correlation between the critical thinking ability variable and learning activities. This is in line with (Nahdi, 2015) who states that learning activities are related to the development of students' critical thinking skills. Group discussion activities to solve problems are one of the learning activities that support the development of students' learning activities.

The next test is the r produt moment test to test the level of correlation between variables. The critical thinking ability variable has a very high relationship to the learning activity variable. This is evidenced by the r product moment value of 0.813. This is in line with research Maqbullah et al. (2018) which states that critical thinking skills are influenced by student activity up to 92%. These results indicate that there is a very strong correlation between critical thinking skills and learning activities. The magnitude of the relationship between critical thinking ability variables and learning activities is influenced by the PjBL-flipped classroom learning model applied to learning activities that can improve students' critical thinking skills, especially in completing the projects given, so that student learning activities also increase. Learning activities that are able to activate students make the learning process more meaningful (Ekaputra, 2020). Learning that requires students to solve problems in the project given can improve students' critical thinking skills, so that student activity in learning increases,

especially in finding material concepts independently (Rosita & Nuranisa, 2019).

Therefore, in this study it can be concluded that there is a very good correlation between students' critical thinking skills and learning activities after the application of the flipped classroom-PjBL learning model, especially for students who take the assessment of the process and learning outcomes of chemistry class C Chemistry Education Study Program, Jambi University.

CONCLUSIONS AND SUGGESTIONS

Conclusions

The conclusion of this study is that there is a very good correlation between students' critical thinking skills and learning activities after the application of the flipped classroom-PjBL learning model, the level of correlation between critical thinking skills and learning activities is very high with a value of 0.813.

Suggestions

Suggestions for further research are to use the flipped classroom-PjBL learning model in improving critical thinking skills and learning activities.

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