

# Implementing Local Wisdom-Integrated Project-Based Learning Model to Instill Students' Learning Independence

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**Abstract.** Local Wisdom-Integrated Project-Based Learning is an innovative learning that emphasizes complex inquiry-based activities to solve problems. The application of this model supports the attainment of the concept of independent learning, which includes students' learning on their own initiative in identifying learning needs, formulating learning objectives, identifying learning resources, selecting and determining learning strategies, and evaluating learning outcomes. The aims of this study are: 1) to determine the effect of the model on students' learning independence, 2) to find out how effective the model is to students' learning independence, 3) to analyse students' learning independence, and 4) to analyse the factors that influence students' learning independence. The research method used in this study is mixed methods with a sequential explanatory design. The sequential explanatory method is a type of mixed method. For this study, the first stage uses quantitative methods, while the second stage uses qualitative methods. The population and the sample are the 6th-semester students, selected through a total sampling technique. The first stage will be implementing the project-based learning model in lectures and testing hypotheses related to the effect of the project-based learning model on students' learning independence. Learning independence data was obtained through a questionnaire and tested using the paired sample t-test and N-Gain. The second stage is research by collecting qualitative data related to the implementation of the project-based learning model and students' learning independence. The results of this research are: 1) There is an effect of implementing the project-based learning model on students' learning independence, 2) The project-based learning model is effective in increasing students' learning independent, 3) The increase in N-Gain is in the medium category, 4) Factors that influence students' learning independence include learning motivation, learning facilities, and lecturers' learning models/methods.

## 1 Introduction

Learning today needs to be adapted to the demands of 21<sup>st</sup>-century skills. Students are required to have critical thinking, creativity and innovation, collaboration, and

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communication skills [1] [2]. Currently, global challenges require students to be able to communicate both verbally and written and have good teamwork, high creativity, research skills, and problem-solving abilities [3]. Therefore, an appropriate learning model is needed so that the learning carried out can facilitate students to develop these skills. The existence of the pandemic requires learning at all levels of education to be carried out online. For online learning to run effectively, independent learning from students is needed. However, in the implementation of the learning, several problems were found. These problems encompass difficulty in choosing the right model, method, and media on the part of the educators, as well as students' low learning independence [4] [5].

Independent learning is a mindset to control yourself and motivate yourself. This independence takes the form of responsibility, activity, creativity in learning, and the ability to solve problems in learning [6]. Independent students will be able to find the learning resources needed. Learners can overcome obstacles in learning, such as inconducive learning conditions, unclear material delivery, and difficult subject matter, and can seek solutions so that learning achievement becomes better. Independent learning must be owned by every student. This is because such a world is a world towards maturity; thus, in every learning, there must be an effort to mature [7].

Based on the results of the documentation conducted on students' online learning, students' learning independence still needs to be improved. This can be seen from: 1) students' dependence on fellow group members in completing assignments, 2) students' still copying assignments from other students, 3) students' low initiative in finding learning resources, students' dominantly using learning resources from lecturers, 4) low level of discipline in online lectures and collection of assignments.

Therefore, it is necessary to design an appropriate learning model to instill students' learning independence. One of the suggested learning models is project-based learning [8] [9]. Project-based learning is a learning model that focuses on the fundamental concepts and principles of a discipline, involves students in problem-solving activities and meaningful tasks, and allows students to work autonomously in constructing their learning. It culminated in producing valuable, realistic, and realistic student work products.

Local wisdom that is integrated into the learning will provide new things for students. Learning, especially science, will be very meaningful if presented in a fun context, such as local wisdom [10] [11] [12]. Local wisdom-integrated project-based learning provides opportunities for students to develop creative thinking skills through learning projects by generating local wisdom-related ideas based on their knowledge [13] [10].

There are eight indicators of independent learning, including 1) Desire and awareness (initiative) to learn; 2) Ability to solve problems; 3) Self-determination; 4) Creativity and initiative in utilizing learning resources and choosing learning strategies; 5) Ability to hold back; 6) Ability to be responsible for their own decisions; 7) Diagnosing learning needs; 8) Monitoring and evaluating learning activities [14]. Independence is linked to discourses on educational success, self-regulated learning, and children's independent mobility [15].

A realistic approach to students' life, concepts that are based on their needs, stimulation of students' sense of curiosity, good concept retention, and growth of problem-solving skills are indeed the strong points [16]. Independence assists the students in establishing their learning strategies, managing their study time, organizing their study space, evaluating their learning activities, achieving learning material understanding barriers, evaluating their learning abilities, selecting the best sources of learning materials, and gaining learning materials and collaborate with them [17].

The urgency of this research is that independent learning is needed so that students are responsible for organizing and disciplining themselves. Independence in learning provides a firm foundation for success in achieving maximum learning outcomes. The implication of this research is to train students' independent learning because it provides opportunities for

students to construct their understanding of problem-solving. Students who have independent learning will work individually or in groups and dare to express their ideas [18].

## 2 Methods

This research uses a sequential explanatory method which is a type of mixed method. The first stage is carried out using quantitative methods, and the second stage is carried out using qualitative methods [19]. Thus, this study aims to determine the effect of the project-based learning model on students' learning independence, analyze the implementation of project-based learning in instilling students' learning independence, and describe the influencing factors.

The quantitative research design used is the one-group pretest-posttest design, which gives treatment to a group of subjects in a certain period of time. Measurements were taken before and after the treatment was given, and the difference between the results of the initial measurement and the results of the final measurement as the effect of the treatment given was analyzed using paired sample t-test. The N-gain test was used to determine the effectiveness of the implementation of local wisdom-integrated project-based learning on students' learning independence.

After statistical testing and quantitative analysis have been carried out, a qualitative analysis is carried out. The qualitative analysis includes the stages, according to Miles and Huberman [20]. According to Miles and Huberman [20], there are three steps of qualitative data processing, namely data reduction, data presentation, and conclusion. The participant students belonged to state and private universities of Universitas Slamet Riyadi. The population and the sample are the 6<sup>th</sup>-semester students amounting to 29 students, which were selected through a total sampling technique.

## 3 Result and Discussion

Based on the results of the pretest on students' learning independence, the highest score for the pretest was 99, while the lowest score was 72. Meanwhile, the highest score for the post-test was 106, and the lowest score was 81. The results of the data analysis obtain a pretest mean of 88.28 and a post-test mean of 94.52.

Based on the normality test, the results of the pretest for students' learning independence have a significant value of  $0.198 > 0.05$ . Therefore,  $H_0$  is accepted; before the implementation of project-based learning, the student's learning independence is normally distributed. Meanwhile, the post-test showed a significance value of  $0.200 > 0.05$ , which means that after the implementation of project-based learning, the student's learning independence was normally distributed.

### 3.1 Quantitative Data Analysis

Based on the normality test, the results of the pretest for students' learning independence have a significant value of  $0.198 > 0.05$ . Therefore,  $H_0$  is accepted; before the implementation of project-based learning, the student's learning independence is normally distributed. Meanwhile, the post-test showed a significance value of  $0.200 > 0.05$ , which means that after the implementation of project-based learning, the student's learning independence was normally distributed.

The homogeneity test shows that the students' learning independence pretest results have a significant value of  $1.129 > 0.05$ . Therefore,  $H_0$  is accepted, and the pretest of the students' learning independence is homogeneous. The post-test of the students' learning independence

has a significant value of  $0.846 > 0.05$ . Therefore,  $H_0$  is accepted, and the post-test of students' learning independence is homogeneous.

The result of paired sample t-test is 8.657 with sig. (2-tailed) of  $0.000 < 0.05$ . These results state that  $H_0$  is rejected, and it can be concluded that there are differences in students' learning independence before and after the implementation of the model. Based on the calculation of the N-gain formula, the results obtained are 0.306. Therefore, the results show that the increase in students' learning independence is within the medium category.

### 3.2 Qualitative Data Analysis

After going through quantitative data analysis testing, qualitative data were collected by observing and interviewing 29 students. Based on the results of the interviews with 29 students, it was obtained that the student's ability to manage and regulate their learning (self-regulated learning) is very important. This shows that independence in learning is the major capital that must be developed for each student. Learning that uses a project-based learning model directs students to create a project. Because of the project work, students will independently build their knowledge, improve their problem-solving skills, and develop their thinking and communication skills. A percentage of students' responses to independent learning with blended learning show positive things. In blended learning, students with good learning independence use learning resources creatively and actively. They can make their own decisions, are responsible, and can evaluate their learning progress well through their own learning strategy. The existence of blended learning allows students to complete homework on time and follow instructions from the lecturer.

The use of this model can effectively improve the learning outcomes of students' knowledge and attitudes. Students will independently build their knowledge, be able to solve problems, and develop thinking and communication skills.

The model used is Laboy-Rush's STEM-project-based learning, which consists of 5 syntaxes, namely reflection, research, discovery, application, and communication [21]. Local wisdom that is integrated into the learning will provide new things for students. Learning, especially science, will be very fun if it is presented in a fun context, such as local wisdom. Project-based learning that is integrated with local wisdom provides opportunities for the students to develop their creative thinking skills through learning projects by generating ideas related to local wisdom based on their knowledge [13].

The purpose of education that is based on local excellence is to actively develop students' potential knowledge, skills, and attitudes, which will facilitate them in contributing to the development of their state and nation. It is accomplished by carefully exploring and utilizing the potential of the local area to create a learning environment and learning process. A kind of learning technique known as culture-based learning offers students activities from various priority cultural backgrounds.

Students with good learning independence use learning resources creatively and actively in blended learning. They can make their own decisions, are responsible, and can evaluate their learning progress well through their respective learning strategies. In such a situation, all parties in the education sector must be able to adapt quickly. The new challenge faced by the world of education is the monitoring and evaluation system that must be arranged so that online learning, especially blended learning, cannot be separated from the path of the teaching process [22] [23].

Independent learning views learners as managers and owners of the responsibility for their learning process by integrating self-management, such as 1) managing schedules; 2) determining how to select sources; 3) carrying out learning with self-monitoring, such as monitoring; 4) evaluating; 5) setting learning strategies [18]. Learners' willingness and motivation play an important role in starting, maintaining, and implementing the learning

process so that the control of the learning shifts from the teachers/lecturers to the learners. Self-study allows transferring of conceptual knowledge to new situations, eliminating the gap between knowledge on campus and the realities of life [24] [25].

Factors that influence students' learning independence include learning motivation, learning facilities, and lecturers' learning models/methods. Nowadays, it is believed that an individual's thoughts and beliefs, which are then translated into actions, have a larger role in motivating than stimulus and reinforcement. In the motivational framework, there are two types of learning motivation: internal and external. Examples of internal variables, which are the primary type of motivation for learning, include intrinsic interest in the activity, the perceived value of the activity, and mastery [26] [27]. Building a teaching and learning strategy is an essential task for both lecturers and students. Innovation in methods and forms of teaching and learning and in conducting examinations and evaluations are in the direction of developing and promoting students' creativity [28].

The analysis presented above demonstrates that teachers must develop their knowledge, abilities, and attitudes toward students. They ought to outline each student's needs by their behavior, decide what needs to be done (what is possible?), explain how it should be done (how should it be done?), and specify the degree of success (how much is required?) [28] [29] [30]. Most of the participants expressed that the student's interest in their new approach to teaching encourages them to apply more of the new teaching methods [31].

The effect of a change in the educational system demands the readiness of lecturers, students, and campuses to manage this online learning. Students are dissatisfied with this learning approach because of the challenges and issues they face when using e-learning. This challenge is brought on by the independent learning styles that students must eventually adopt, peer support, interaction, and flexibility between coworkers and instructors, among other factors that become barriers to the use of e-learning [32]. Support in the form of adequate resources and facilities is very important to support learning [31-34]

## 4 Conclusion

Based on the results of the data analysis and discussion above, the following conclusions can be formulated: First, there is an effect of the implementation of the project-based learning model on students' learning independence. Second, the project-based learning model is effective in increasing students' learning independence. Third, the increase in N-Gain is in the medium category. Fourth, factors that influence students' learning independence include learning motivation, learning facilities, and lecturers' learning models/methods.

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