

The Implementation of Innovative Technology-Based Project Based Learning Models in Enhancing Student Creativity

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Abstract. This research aims to understand the implementation of the innovative technology-based project-based learning model in improving students' creativity and to determine the influence of the innovative technology-based project-based learning model on enhancing student creativity. The research method used in this study is a quantitative approach with a survey research design. The population size is 40 individuals, and a sample of 20 individuals was selected through random sampling. Data collection methods included observation, interviews, documentation, and questionnaires. Assumptions were tested for normality and linearity. Data analysis involved a simple linear regression test. The results of this research indicate that (1) The description of the implementation of the innovative technology-based project-based learning model falls into the "excellent" category for 3 students, or 15%, and the "good" category for 17 students, or 85%, (2) There is a positive influence of the Innovative Technology-Based Project-Based Learning Model on Enhancing Student Creativity.

Keywords: Project Based Learning, Innovative Technology, Creativity

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INTRODUCTION

The rapid advancement of technology and fast-paced changes in the job market demands that students possess more creative, innovative, and skilled abilities in using technology. Simultaneously, it provides opportunities to develop and utilize various innovations to enhance creativity and the capacity for learning system accessibility. Higher education systems are expected to produce highly competitive graduates. A good learning system can provide students with the learning experiences to unlock their potential in internalizing knowledge, skills, attitudes, and learning experiences. (Hariani, 2019).

One of the problems faced by the education world is the weakness of the learning process. During the learning process, children are not sufficiently encouraged to develop their thinking abilities. Based on Minister of National Education Regulation (Permendiknas) number 41 of 2007 regarding the Process Standards, which regulate the learning process planning that requires educators in educational units to develop Lesson Implementation Plans (RPP). One element in the Lesson Implementation Plan (RPP) is learning resources. The teacher's ability to develop teaching materials plays a crucial role in determining the success of the teaching and learning process through a teaching resource (Sungkono, dkk. 2003).

In addition to selecting appropriate teaching materials for the learning process, a teacher must also choose an appropriate teaching approach or model so that students can truly understand the meaning of the material they are learning. A teaching model is a detailed plan that outlines the process and creates an environmental situation that allows students to interact (Nisah, dkk. 2021). One of them is through the Project Based Learning (PBL) teaching model. The Project Based Learning teaching model is an approach that allows students to work independently in constructing their learning and culminating it in tangible products (Hanafiah & Suhana, 2009). Project-Based Learning is an innovative approach to learning that emphasizes contextual learning through complex activities (Al-Tabani, 2014).

The Project Based Learning (PBL) learning model is an approach to education that attempts to connect technology with everyday life problems familiar to students, or with a school project (Warsono & Hariyanto, 2012). In the Project Based Learning (PBL) model of education, students will be presented with a problem or given a project related to the subject matter. Subsequently, students will be asked to solve or create a project/activity based on questions and issues. This is followed by a process of researching, investigating, and discovering independently, allowing students to acquire comprehensive knowledge by using ideas or new concepts acquired from theories, concepts, and information that have been developed into something new and different (Natty, dkk. 2019).

Solving problems and generating something new is a complex activity that is closely related to each other, resulting in one's creativity. Creativity is the ability someone possesses to produce something new, whether from their ideas and concepts, which will result in something useful (Kristin, 2016). In the learning process, teachers are required to be creative in their lesson delivery so that students do not get bored. Therefore, good classroom management by the teacher is needed. Good classroom management will attract the interest and willingness of students to

engage with the teaching materials presented by the teacher. If a teacher's teaching style is monotonous, it will make students feel bored and disengaged from the lesson because, fundamentally, effective teaching methods are needed in the implementation of learning. Thus, in the learning process, it is necessary to create enjoyable learning innovations that encourage students to express their creativity by using the project-based learning (PBL) model.

The implementation of the Innovative Technology-Based Project Based Learning Model in Enhancing Students Creativity distinguishes itself from previous research that focused on project-based learning models by emphasizing two elements: innovative technology-based learning models and student creativity. This research not only evaluates the positive impact of the learning model in the teaching and learning process conducted by Murniarti (2014) in her study but also extends its analysis to encompass the development of students' creativity. The research conducted by Anggraini & Wulandari (2021) employed a qualitative descriptive research method in project-based learning, focusing on enhancing student activities. In contrast, this study utilizes a quantitative descriptive approach to measure the extent of the implementation and impact of the Innovative Technology-Based Project Based Learning Model in enhancing students' creativity. Based on the issue, we are interested to conduct a study with the title "Application of Innovative Technology-Based Project-Based Learning Models in Enhancing Students Creativity".

RESEARCH METHOD

Research Design

This research employs a quantitative approach with a survey research design, aiming to depict or explain a problem whose results can be generalized. The data collection instrument used is a questionnaire. The variables in this study consist of one independent variable (X) and one dependent variable (Y). The specified independent variable X is the Innovative Technology-Based Project-Based Learning Model and the dependent variable Y is students' learning creativity.

Data Collection Techniques

The data collection techniques in this research consist of 1) observation, which involves direct observation and recording at the research location; 2) interviews, which involve collecting data/information related to the research obtained directly from relevant individuals; 3) documentation, consisting of searching for information related to the innovative project-based learning technology model and various other supporting secondary data; and 4) questionnaire, which is primary data collected from respondents, in this case, students at Madrasah Tsanawiah Cambajawaya, Kabupaten Gowa.

Population and Sample

This research was conducted at Cambajawaya Junior High School, Gowa District. The research took place from June 2023 to July 2023. The research population consisted of all 7th-grade students, totaling 40 individuals from classes 7A and 7B. Meanwhile, the sample was determined using the Random Sampling technique, with 20 individuals selected from class 7A.

Research Instruments

The research instrument used is a questionnaire consisting of surveys on the implementation of the Innovative Technology-Based Project-Based Learning Model and students creativity.

Data Analysis Technique

The results or data from the research are analyzed to determine their validity and reliability. The data analysis method employs simple linear regression with a questionnaire as the instrument to be distributed to the respondents. In the data analysis phase, the researcher utilizes the SPSS 16 software program.

FINDING AND DISCUSSION

Finding

The implementation of the Innovative Technology-Based Project-Based Learning (PBL) model involves several steps in the learning process, namely: 1) project determination; 2) planning the project's completion steps; 3) arranging the project implementation schedule; 4) completing the project with teacher facilitation and monitoring; 5) compiling project reports and presenting/publishing project results; 6) project evaluation and outcomes. After the implementation of the learning model in the classroom, the researcher administered a questionnaire on the Innovative Technology-Based Project-Based Learning (PBL) model and a questionnaire on student creativity.

The obtained data was analyzed using prerequisite testing and hypothesis testing, but let's first take a look at the overview of the Innovative Technology-Based Project Based Learning Model and the overview of Student Creativity. Here is the description.

Table 1. Overview of Innovative Technology-Based Project-Based Learning Models

No	Interval Score	Predicate	Criteria	Frequency	Percentage
1	91 – 100	A	Very Good	3	15%
2	75 – 90	B	Good	17	85%
3	60 – 74	C	Sufficient	0	0%
4	54 – 59	D	Less	0	0%
5	<54	E	Very Less	0	0%
				20	100%

Based on Table 1, it is evident that the Innovative Technology-Based Project-Based Learning model is performing well. This can be observed from the 20 students who were sampled for the study, where 3 individuals (15%) scored between 91 - 100, indicating excellent performance, and 17 individuals (85%) scored between 75 - 90, which falls under the category of good performance.

Table 2. Description of Student Creativity

No	Interval Score	Predicate	Criteria	Frequency
1	61 – 75	Very Good	10	50%
2	50 – 60	Good	8	40%
3	40 – 49	Sufficient	2	10%
4	30 – 39	Less	0	0%
5	<30	Very Less	0	0%
			20	100%

Based on Table 2, it is evident that the students' creativity is very high. This is observed from the 20 students who were part of the research sample, where 10 individuals (50%) fall into the "very high" category, 8 individuals (40%) fall into the "high" category, and 2 individuals (10%) fall into the "adequate" category. The research data was processed using SPSS to obtain answers to the research problem formulation. Data analysis for hypothesis testing was conducted using simple regression analysis. Before hypothesis testing, prerequisite analyses were conducted, namely normality test and linearity test. The following are the results of the prerequisite analysis.

Table 3. Results of Variable Normality Test

Variable	Skewness Value	Description
Innovative Technology-Based PBL Learning Model	-0,269	Normally distributed
Student Creativity	0,159	Normally distributed

Table 3 shows that the collected data for the Innovative Technology-Based Project Based Learning Model variable has a skewness value of -0.269, and for the student's creativity variable, it is 0.159. These values fall within the range of 1 and -1, indicating that all four collected variables are normally distributed. Furthermore, the results of the linearity test can be seen in the table 4:

Table 4. Results of Variable Linearity Test

			Sum of Squares	df	Mean Square	F	Sig.
Student Creativity * Learning Model	Between Groups	(Combined)	311,383	3	103,794	2,589	,089
		Linearity	306,250	1	306,250	7,639	,014
		Deviation from Linearity	5,133	2	2,567	,064	,938
	Within Groups		641,417	16	40,089		
	Total		952,800	19			

Table 4 obtained a linearity value with a significance level of 0.014 (Sig. 0.014) < 0.05 (alpha 5%), thus it can be concluded that there is a linear relationship between

the Innovative Technology-Based Project-Based Learning Model variable and student creativity.

Table 5. Simple Regression Analysis Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,567 ^a	,321	,284	5,993	,321	8,526	1	18	,009

a. Predictors: (Constant), Learning Model

Based on Table 5, it shows an R-value of 0.567 and a significance value (Sig.) of 0.009. The significance value (Sig.) obtained is smaller than the 5% level of significance ($0.009 < 0.05$).

Discussion

Based on the results of the data analysis, it is evident that the description of the Innovative Technology-Based Project-Based Learning Model has been successfully implemented. In terms of this learning model at Madrasah Tsanawiah Cambajawaya, class 7A, falls into the "very good" category with 15% of students, while 85% of students fall into the "good" category. This indicates that the learning process has met expectations, as both the minimum completeness criteria (KKM) targeted have been achieved, both on an individual and class-wide basis. The Project-Based Learning model is a teaching approach that actively involves students, both individually and in groups, in achieving learning objectives by producing tangible products or works (Sastradiharja & Febriani, 2022). By employing Project-Based Learning, education is not merely about memorizing concepts with the teacher as the sole source of information. Instead, it encourages learners to actively participate, as they are tasked with various activities such as group work, interacting with peers, and expressing opinions during the learning process (Dinda & Sukma, 2021).

Based on the results of data analysis, it is evident that the description of Student Creativity has been successfully implemented in the Project-Based Learning teaching process. In terms of student creativity at Madrasah Tsanawiah Cambajawaya class 7A falls into the "very high" category, with 50% in this category, 40% in the "high" category, and 10% of students in the "adequate" category. In this research, it can be concluded that student creativity is in the "very high" category. Student creativity can stimulate and develop unique, innovative, and imaginative ways of learning, enabling students to solve various learning problems creatively. The research concludes that students' creativity is low because students tend to follow the learning process, and there is a lack of channeling student ideas in learning (Rifai, et al., 2021). Therefore, students require an applicable and innovative learning model to develop creativity and ensure optimal understanding of the learning materials.

Based on the results of simple regression analysis, it is evident that there is an influence of the Innovative Technology-Based Project-Based Learning model in enhancing student creativity. Meanwhile, the contribution of the innovative technology-based project-based learning model to students creativity is 32.1%. This

can be seen in Table 5, which reveals an R-squared value of 0.321. Thus, the project-based learning model implemented by teachers can enhance students' creativity and provide freedom in critical thinking, enabling them to solve problems independently.

CONCLUSION

Based on the data obtained and the analysis that has been conducted, the following conclusions can be drawn:

1. The description of the implementation of the innovative project-based learning technology-based learning model falls under the "excellent" criteria for 3 students or equivalent to 15%, and under the "good" criteria for 17 students or equivalent to 85%.
2. There is a positive influence between the Innovative Technology-Based Project Based Learning Model on Enhancing Student Creativity. This is indicated by the significance value being less than the (α) 5% level.

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