



The Effectiveness of the Project-Based Learning Model on Students' Creativity in Storybook Design

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Abstract

This study aims to determine the effectiveness of the Project-Based Learning (PjBL) model on students' creativity in storybook design among 10th-grade Visual Communication Design (VCD) students at SMKN 2 Magetan. The study employed a quantitative approach using a true experiment with a posttest-only control group design. The research subjects consisted of 36 10th-grade VCD students in Class B as the experimental group and 36 10th-grade VCD students in Class C as the control group. Data were collected through observation and a creativity assessment questionnaire comprising 10 items using a Likert scale. The data were analyzed using validity, reliability, normality, and homogeneity tests, as well as an independent samples t-test. The results showed that all instruments were valid and reliable, and the data were normally distributed and homogeneous. The average creativity score for the experimental class was 33.33, while that for the control class was 32.92. The independent-samples t-test yielded a p-value of $0.827 > 0.05$. Thus, there was no significant difference in creativity between the experimental and control classes. The research results indicate that the implementation of PjBL has not yet produced a significant difference in creativity regarding storybook design material.

Keywords: Project-Based Learning, Student Creativity, Storybook Design, Visual Communication Design.

INTRODUCTION

Sustainable Development Goals (SDGs) 4 emphasizes the importance of inclusive, high-quality education and provides lifelong learning opportunities for all (Grotlüschen et al., 2024). In addressing the demands of the 21st century, quality education is not only focused on the acquisition of knowledge but must also equip students with skills relevant to life and the workplace (Herlinawati et al., 2024). The 21st-century educational skills framework is the 4Cs, which include: creativity, critical thinking, communication, and collaboration (Julianto et al., 2024). This framework aligns with the Visual Communication Design (VCD) program, which emphasizes creative abilities to generate and develop ideas into visual products (Awing

et al., 2025). In VCD education, students' creativity is reflected in their ability to explore and develop ideas into concepts and visual works, which encourages them to produce diverse and innovative design works in line with visual communication needs (Hadjaratie et al., 2024). Creativity is a person's ability to take actions that result in new creations, whether in the form of thoughts including new ideas, concepts, and theories or in the form of objects including tangible products of the mind that can be seen, touched, or felt (Lestari & Zakiah, 2019).

Despite this current phenomenon, however, data from a previous study at SMKN 2 Gowa in the 11th-grade Visual Communication Design (DKV) class showed an average score of 66 in the DKV course (Nur & Asmad, 2024). Additionally, at SMKN 1 Jabon in the 11th-grade DKV class, the average creativity score was 41.25 in the audio-video processing techniques course (Umaeroh & Arianto, 2023). Another finding was at SMKN 1 Kopang in the 11th-grade DKV class, where the average pretest score was 50 for the use of basic *Corel Draw tools* (Agusrin & Sofiansyah, 2026). Low levels of DKV students' creativity were also found at SMKN 6 Surabaya in the 11th-grade DKV class during poster design instruction, with a pretest average of 64.71 (Mustafidah & Susanti, 2024) and at SMK Muhammadiyah 4 Kalisat in the 10th-grade DKV class with a pre-cycle average of 57.83 during short story writing instruction (Kurniawati et al., 2025).

Based on the results of previous research, similar events also occurred among 10th-grade Visual Communication Design (DKV) students at SMKN 2 Magetan, who served as the subjects and objects of this study. The results of the initial survey of these subjects and objects revealed that the students' creativity scores on the storybook design assignment were 55.67 for 10th-grade DKV Class B and 75.55 for 10th-grade DKV Class C. The low level of creativity among 10th-grade DKV B students may be related to a lack of stimulation for exploring ideas, as DKV instruction requires strategies capable of motivating students to develop ideas during the design process (Awing et al., 2025). Another study also explains that the application of a uniform learning model in Visual Communication Design education can lead to disparities in student learning outcomes (Purwaningsih et al., 2026). Both of these views are supported by the results of observations conducted in the 10th-grade Visual Communication Design class at SMKN 2 Magetan, which revealed that 64% of the implemented learning models used an expository approach by presenting product examples to students. Providing product examples directly makes students passive in seeking broader references (Khoirunnisa & Chamdani, 2026). Therefore, the implementation of more diverse learning models is necessary, requiring students to actively engage in assignments from planning through evaluation (Annisa et al., 2026).

In response to the data and findings from the field, the implementation of a project-based learning model known as Project-Based Learning (PjBL) needs to be adopted as a solution to address these issues. The PjBL model is capable of enhancing students' creativity and competencies in vocational education (Usmaldi & Amini, 2022). Furthermore, the average scores of Visual Communication Design (VCD) students using the project-based learning model were higher than those of VCD students using the conventional model (Laute et al., 2026). Other similar studies have also shown that the project-based learning model can enhance the creativity of Visual Communication Design (VCD) students in illustration design; this is evidenced by the fact that the illustrations produced by students using the project-based learning model are more varied compared to those produced by students using the conventional model (Setiawan et al., 2025). While several previous studies have shown that project-based learning models can enhance student creativity, there has been limited research examining the effectiveness of project-based learning models on student creativity in storybook design courses for 10th-grade Visual Communication Design students at SMKN 2 Magetan.

In the course on storybook design, the core learning objectives of the vocational program focus on the ability to produce a complete storybook (Yulius et al., 2025). Students are required to develop ideas, create a story, and select visuals that complement the story they have created (et al., 2026). These characteristics of the material relate to one of the components of the PjBL model, namely planning (Setiawan et al., 2025). Creativity has four indicators, including: originality, flexibility, elaboration, and fluency (Alabbasi et al., 2022). Student creativity can also be developed through learning activities that provide students with opportunities to actively engage in problem-solving, project planning, and the creation of products as a realization of the ideas they have developed (Usmaldi & Amini, 2022). In this context, the PjBL model is a learning model that requires students to be active and exploratory in determining and seeking information on their own regarding the assigned project, from planning the project to its evaluation (Asril et al., 2026). This learning model also organizes the learning process through the completion of authentic projects that result in specific products, positioning students as active participants in planning, implementing, developing, evaluating, and reflecting on the process of project completion, while teachers serve as facilitators and mentors (Loyens et al., 2023).

Based on the data presented, low student creativity can impact the implementation of SDGs 4 quality education as well as the demands of the 21st century. Therefore, this study is important because its objective is to determine the impact of applying the PjBL model to

storybook design material on the creativity of 10th-grade Visual Communication Design (DKV) B and C students at SMKN 2 Magetan. Based on this objective, the results of this study can serve as recommendations for using project-based learning models to enhance student creativity.

METHOD

This study is a true experiment using a posttest-only control group design, with the following research design:

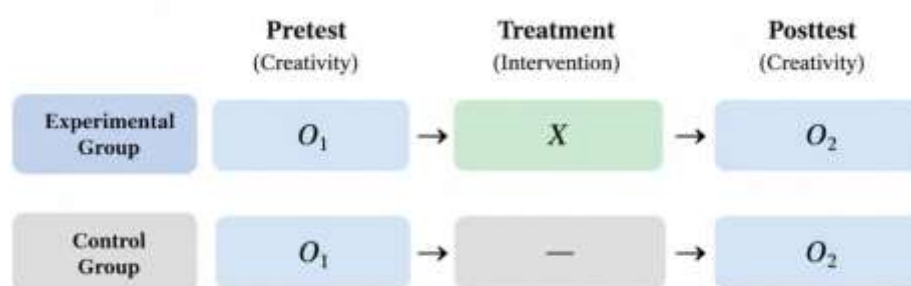


Figure 1. Posttest-Only Control Group Design

The independent variable in this study was the PjBL model, while the dependent variable was student creativity. The study was conducted at SMKN 2 Magetan by applying the PjBL model to 36 students in Class X DKV B as the experimental group and 36 students in Class X DKV C as the control group, which did not receive the PjBL model.

The data collection techniques used in this study were observation and questionnaires. Observation is a data collection technique that involves systematically observing objects, phenomena, or behaviors in the field without intervening, and then recording them to obtain accurate and objective data (Soesana et al., 2023). In this study, observation was applied to observe the learning process and the facilities and infrastructure used for teaching and learning. Meanwhile, a questionnaire is a data collection instrument consisting of a set of written questions or statements administered to respondents to obtain information in accordance with the research objectives (et al., 2024). The questionnaire for assessing the creativity of 10th-grade DKV B students consists of ten statements in the form of a Likert scale ranging from a score of 1 to 4. The scale indicators can be explained as follows:

Table 1. Assessment Scores

Score	Indicator
4	Very High
3	Moderate
2	Fair
1	Low

Before the assessment instrument was used, the validity and reliability of the ten items were tested. The purpose of these two tests was to ensure that each question aligned with the indicators being measured and to assess the consistency of respondents' answers which is the objective of validity and reliability testing (Fitria et al., 2025). The data were analyzed using the Pearson-Moment Correlation test to determine the validity of each statement item with a significance level ($\text{Sig} \leq 0.05$) and Cronbach's alpha test to determine the reliability of the instrument with a significance level ($\text{Sig} \geq 0.06$).

Next, the data from the product evaluation questionnaire were analyzed using IBM SPSS Statistics 25 software. The validated and reliable data were analyzed using a normality test to determine whether the research data were normally distributed before testing the hypotheses (Fajri et al., 2024). The Shapiro-Wilk test was selected as the normality test because the sample size was ≤ 50 to determine whether the data distribution was normal (Wardani et al., 2024). If the data are normally distributed, a homogeneity test is then conducted to determine whether two or more sample groups drawn from the population have equal variances (Usmadi, 2020). If the results of the normality and homogeneity tests show a significance level ($\text{Sig.} \geq 0.05$), then a parametric test is used (Siregar, 2026). In this study, a parametric test was used, specifically an independent samples t-test, with the following conditions: if $\text{Sig. (2-tailed)} > 0.05$, H_0 is accepted and H_a is rejected; and if $\text{Sig. (2-tailed)} < 0.05$, H_a is accepted and H_0 is rejected (Gunawan, 2019).

RESULTS AND DISCUSSION

1. Validity and Reliability Tests

The results of the validity test for the creativity assessment instruments of the experimental and control groups are presented as follows:

Table 2. Validity Test Results for the Experimental Class

Statement	Sig. (2-tailed)	Condition	Remarks
P1	0.009	Sig. < 0.05	Valid

P2	0.013
P3	0.007
P4	0.008
P5	0.040
P6	0.028
P7	0.007
P8	0.003
P9	0.006
P10	0.019

Table 3. Validity Test Results for the Control Class

Statement	Sig. (2-tailed)	Condition	Notes
P1	0.001	Sig. < 0.05	Valid
P2	0.019		
P3	0.005		
P4	0.015		
P5	0.028		
P6	0.032		
P7	0.003		
P8	0.004		
P9	0.011		
P10	0.015		

Based on the results of the validity test of the student creativity assessment instrument, which consisted of ten statements in the experimental and control classes, the sig. (2-tailed) value was > 0.05, and the data were deemed valid. After the data were deemed valid, the next stage was the reliability test, which is presented as follows:

Table 4. Reliability Test Results for the Experimental and Control Classes

Class	Cronbach's Alpha	Requirement	Remarks
Experimental	0.668	Sig. > 0.60	Reliable
Control	0.674		

Based on the results of the reliability test for the experimental and control classes, it was found that the Cronbach's Alpha values for both classes showed a significance level (Sig.) > 0.60, and the data were deemed reliable. The next step was to test the data for normality.

2. Normality Test

Once the data had been deemed valid and reliable, a normality test was conducted to determine whether the research data followed a normal distribution, as shown below:

Table 5. Results of the Normality Test for the Experimental and Control Classes

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Experimental Class	0.133	36	0.108	0.977	36	0.649
Control Group	0.131	36	0.126	0.965	36	0.314

Based on the results of the normality test in the experimental and control groups, the Shapiro-Wilk normality test for both groups showed a significance level (Sig.) > 0.05, and the data were determined to be normally distributed.

3. Homogeneity Test

This test was conducted to determine whether two or more groups of data samples drawn from the same population had equal variances. The data are presented as follows:

Table 6. Results of the Homogeneity Test

Levene's Statistic	df1	df2	Sig.
0.048	1	70	0.827

Based on the results of the homogeneity test for these two classes, the Sig. value was found to be > 0.05, and the data were deemed homogeneous for parametric testing using an independent samples t-test

4. Independent Samples t-Test

The final step is to compare the mean scores of the two unpaired classes. The mean scores for the two classes are presented as follows:

Table 7. Results of the Independent Samples t-Test

Class Group	Mean	Sig.
Experimental Class	33.33	0.827
Control Class	32.92	

Based on the results of the independent samples t-test of the data from the two classes, the mean score for the experimental class was 33.33 and for the control class was 32.92, with a p-value > 0.05. Thus, H_0 is accepted and H_1 is rejected. Therefore, it can be

concluded that there is no statistically significant difference between the means of the two tested sample classes.

5. Interpretation of Results

The research results indicate that the student creativity assessment instrument used in the experimental and control classes met the validity and reliability requirements. All 10 statements in both classes had a Sig. value < 0.05 and were therefore deemed valid, while Cronbach's Alpha values of 0.668 in the experimental class and 0.674 in the control class indicated that the instruments met the criteria for reliability. Furthermore, the results of the Shapiro-Wilk normality test showed significance values of 0.649 in the experimental class and 0.314 in the control class, both of which were greater than 0.05, indicating that the data were normally distributed. The homogeneity test also yielded a significance value of $0.827 > 0.05$, so the variances of the two groups were deemed homogeneous and met the prerequisites for parametric analysis.

The results of the Independent Samples t-Test show that the average creativity score for students in the experimental class was 33.33, while that for the control class was 32.92. Although the average for the experimental class was slightly higher than that of the control class by a margin of 0.41 points, the significance value of $0.827 > 0.05$ indicates that this difference is not statistically significant. Thus, H_0 is accepted and H_a is rejected, meaning that there is no significant difference between the average creativity scores of students in the experimental and control classes. These findings suggest that the instructional treatment or conditions applied to both groups did not result in a statistically significant difference in student creativity.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results, the student creativity assessment instrument met the criteria for validity and reliability, while the research data were normally distributed and had homogeneous variance. The results of the independent samples t-test showed that the mean creativity score for the experimental class was 33.33 and for the control class was 32.92, with a significance value of $0.827 > 0.05$. Thus, H_0 is accepted and H_a is rejected, indicating that there is no statistically significant difference in creativity between students who received PjBL instruction and those in the control class.

Based on these findings, the implementation of PjBL in storybook design lessons should be reconsidered through more optimal instructional planning, particularly in providing students with opportunities to explore ideas, plan projects, develop products, and conduct

evaluations. Teachers are also advised to combine PjBL with instructional strategies that can foster student creativity more intensively. Future research could expand the subject matter, develop creativity assessment tools, and consider other factors that may influence student creativity.

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