



An Effort to Enhance Students' Learning Creativity through the Application of the Project-Based Learning Model in Batik Craft Education

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ABSTRACT

The Project-Based Learning (PjBL) model was chosen because it motivates students to actively participate in the learning process while fostering creativity and practical skills in producing batik artworks. The purpose of this study is to enhance students' creativity in classroom learning activities, particularly in the Batik Craft subject. This study employed a Classroom Action Research (CAR) method, involving 25 eleventh-grade Textile students at SMKN 3 Kasihan, Bantul, Yogyakarta. The findings revealed an increase in the average student score from 77.76 in the pre-cycle phase to 86.08 in the second cycle, attributed to the implementation of the PjBL model. Additionally, 100% of the students achieved the minimum mastery criteria, indicating that all participants were able to engage effectively in the learning process. This improvement was also reflected in students' enthusiasm and willingness to participate in discussions and hands-on activities. Thus, this study concludes that the PjBL model is effective in enhancing students' artistic creativity and learning outcomes, particularly in Batik Craft. Furthermore, this research significantly contributes to the advancement of instructional strategies in the classroom and underscores the importance of implementing more interactive and collaborative approaches in art education. It is hoped that the conclusions drawn from this study will support educators in integrating project-based learning paradigms into their teaching practices.

Keywords: batik craft, creativity, learning outcomes, project-based learning

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Introduction

Education is a formal institution aimed at facilitating an effective and efficient teaching and learning process. Through education, it is expected that the younger generation will develop competencies, creativity, and professionalism. Students are expected to acquire broad understanding as well as the ability to think originally, collaborate in teams, and communicate ideas effectively. To achieve educational goals, it is essential to create a learning environment that encourages active student participation. In this context, learning outcomes serve as a standard for measuring the effectiveness of the learning process. Teachers are responsible for guiding students effectively, developing their potential, and employing approaches that are aligned with the demands of the times.

Ki Hadjar Dewantara developed a system known as the Among system, which emphasizes compassion and care. The term originates from Javanese, meaning "to nurture a child" (mong or momong) [1]. Due to its strong emphasis on value-based education centered on the principles of *asah* (sharpening the intellect), *asih* (fostering affection), and *asuh* (nurturing care) Ki Hadjar Dewantara's educational system is considered a relevant and holistic approach to learning [2]. Through this approach, students are expected to develop into independent individuals with noble character and essential life skills. Teachers who apply the Among system bear the responsibility of guiding students in accordance with contemporary developments. Both students and teachers, as facilitators of learning, must be increasingly aware of how the demands of education continue to evolve over time.

The Among system introduced by Ki Hadjar Dewantara is grounded in compassion, care, and dedication, making it a highly suitable approach for educational environments. This system is founded on two core principles: independence, which is essential for stimulating both the physical and spiritual capacities of students to live autonomously; and the essence of human nature, which is needed to rise and progress as swiftly as possible.

The Among system is closely connected to the well-known educational philosophy of Tut Wuri Handayani, Ing Ngarso Sung Tuladha, and Ing Madya Mangun Karsa. However, due to limited public understanding, these maxims are often more widely recognized than the Among system itself. Ki Hadjar Dewantara also proposed an instructional methodology based on the Tri N concept: *Niteni* (observing), *Nambahi* (adding or improving), and *Nirokke* (replicating). This approach is strongly aligned with the principles of the 2013 national curriculum. Tri N learning can be applied across cognitive, psychomotor, and affective domains to foster students' creativity and enable them to explore ideas and modify motifs, rather than merely imitating them [3].

Interaction plays a crucial role in the learning process, as it can encourage students to actively engage in learning activities. Academic achievement is influenced by both external and internal factors. Motivation, interest, and student engagement are examples of internal influences, while external factors include the school environment, family, and the broader community [4].

Art education, particularly in the context of batik craft learning, plays a significant role in developing students' creativity and practical skills. Batik, as part of Indonesia's cultural heritage, holds not only aesthetic value but also embodies important social and cultural meanings that must be preserved and further developed. In the era of globalization, the challenge for educators lies in delivering batik art instruction using methods that are not only effective but also capable of stimulating students' creativity and innovation [5].

One effective model for teaching batik learning is the Project-Based Learning (PjBL) approach. PjBL places high value on active student involvement in classroom learning through the design, implementation, and evaluation of real-world projects. This approach is believed to enhance students' learning motivation, strengthen collaborative skills, and foster creativity in producing artistic works [6].

An educator must be able to offer strategies that foster students' creativity, particularly when learning Batik Craft in the classroom. Project-based learning techniques can be effectively employed to cultivate creativity, as this approach emphasizes student-centered learning in which learners are encouraged to enhance their own creative capacities. In this context, learning Batik Craft involves both theoretical instruction and hands-on practice, guiding students through the entire creative process to produce high-quality works from start to finish. Such projects motivate students to be as imaginative as possible, allowing them to express their ideas in ways that result in aesthetically pleasing artworks with strong market potential. The characteristics of Grade XI Textile students reflect a high interest in the fields of textiles and fashion. These students demonstrate strong creativity in designing and producing textile products. They possess practical skills such as sewing, pattern drawing, and fabric coloring, and they are capable of working with precision and attention to detail.

Teachers provide an assessment rubric that includes criteria such as creativity, perseverance, and neatness in completing assignments. In addition, students are encouraged to absorb as much information as possible from batik artisans. To inspire students, they are asked to observe batik craftsmen directly. Upon completing the Batik Craft lessons, an evaluation is necessary. Evaluation serves as a procedure or tool to

measure how well students perform in relation to the curriculum or instructional material provided, making its implementation in educational activities essential. This is because evaluation is an integral part of the learning process and cannot be separated from education. It ensures that learning objectives are more engaging and easier to comprehend [7].

The purpose of this study is to examine the effectiveness of the Project-Based Learning (PjBL) paradigm in fostering students' creativity in the Batik Craft subject at SMKN 3 Kasihan Bantul. This research is expected to yield valuable insights into how the PjBL model influences student learning outcomes, as well as the challenges and solutions encountered during its implementation. Additionally, it aims to provide a meaningful and relevant contribution to curriculum development within the school setting. Efforts must be made to enhance learning activities, one of which is by implementing instructional strategies that can motivate students to actively participate in the educational process.

Methods

This study employed Classroom Action Research (CAR), consisting of two cycles. Each cycle included four stages: planning, implementation, observation, and reflection. The subjects of the study were 25 students from Grade XI Textile at SMKN 3 Kasihan Bantul. The class was selected based on the identified need to foster creativity during the learning of Batik Craft. Through the CAR approach, the researcher was able to conduct continuous evaluations and improvements in each cycle. In the planning stage, the researcher developed a lesson plan (RPP) that outlined learning objectives, instructional strategies, relevant materials, and teaching media. Additionally, the researcher determined the project theme to be completed by students creating batik with flora and fauna motifs. This theme was chosen to enable students to explore cultural diversity while also developing their technical skills.

The cyclical model developed by Stephen Kemmis and Robin McTaggart was used in this study. For instance, Cycle II demonstrated improvements over Cycle I. The research followed four main phases: planning, implementation, observation, and reflection. These phases were carried out over two cycles. Each cycle consisted of two meetings, with each meeting lasting for six instructional hours. If the target success index was achieved, subsequent cycles (Cycle III or beyond) were deemed unnecessary. However, if the success criteria were not met, the researcher would proceed with additional action cycles. During the sessions, the researcher facilitated the process by providing guidance and support to students at each stage of the batik-making project. Observations were conducted

directly to assess student engagement and participation throughout the learning process. Student interactions, involvement in class discussions, and successful project completion were all recorded by the researcher. Additionally, observation sheets and questionnaires were used to collect data measuring students' creativity and motivation. These data were essential for evaluating the effectiveness of the implemented Project-Based Learning (PjBL) model.

After each cycle, reflection was conducted to evaluate the outcomes and challenges encountered during the learning process. At this stage, both students and the researcher discussed what had been successful and what needed improvement. The purpose of this reflection was to identify the strengths and weaknesses in the implementation of the Project-Based Learning (PjBL) model, as well as to formulate improvement strategies for the subsequent cycle.

Teachers, students, and document records served as the primary data sources in this study. Meanwhile, interviews, tests, questionnaires, and documentation were employed as the methods for data collection. Interviews were conducted to gain deeper insights into the school's context. Tests were administered at the end of each cycle to provide a clear overview of students' creativity development. Questionnaires were distributed after the implementation of the study to evaluate the effectiveness, appeal, and impact of the Project-Based Learning (PjBL) model on the learning process. The focus of the questionnaire was on students, in order to gain in-depth insights into their experiences during the learning activities. Documentation was used to record evidence of student activities throughout the learning process. This included student attendance lists, scores, and photos or videos of students engaging in batik-making activities in the Grade XI Textile class at SMK Negeri 3 Kasihan Bantul, Yogyakarta. All activities related to the research and the students of Grade XI Textile served as the main focus of the documentation. To ensure the validity of the data, triangulation of sources and methods was conducted. Data analysis was carried out using the Miles and Huberman model, which consists of data reduction, data display, and conclusion drawing. Based on the explanation above, the researcher was motivated to conduct a study entitled, "Efforts to Improve Students' Learning Creativity Through the Project-Based Learning Model in the Batik Craft Subject at SMKN 3 Kasihan Bantul."

Results

The results of this study on efforts to enhance students' learning creativity in the Batik Craft subject at SMKN 3 Kasihan Bantul through the Project-Based Learning (PjBL) model were carried out in two research cycles, namely Cycle I and Cycle II, involving students of

Grade XI Textile. The target and success criteria were achieved by the end of Cycle II. Both research cycles encompassed the stages of planning, implementation, observation, reflection, and evaluation of students' artworks. The primary aim of this study was to investigate the extent to which the PjBL paradigm effectively fosters students' creativity in the Batik Craft subject. The findings demonstrate that implementing PjBL significantly enhances students' creative potential. One of the most notable aspects was the students' ability to design and produce aesthetically pleasing batik patterns. Based on the concept of creativity, project-based learning shows strong potential in stimulating students' originality; the assigned projects served as a stimulus for creative thinking and the development of original artistic expressions (Astuti & Aziz, 2019).

Table 1. Students' Learning Test Results: Pre-Cycle and Cycle I

No.	Indicator	Test Scores		MMC
		Pretest	Post-test Cycle I	
1.	Number of students achieving mastery	16	20	75
2.	Number of students not achieving mastery	9	5	
3.	Total score	1,944	2,000	
4.	Average score	77.76	80.00	
5.	Mastery Level (%)	64%	80%	

A total of 16 students achieved mastery during the pre-cycle stage, based on the provided data. However, in Cycle I which represents a significant phase the number of students achieving mastery increased to 20, reflecting a modest gain of four students. This indicates a positive development. Moreover, the comparison in the number of students who did not meet the minimum mastery criteria (MMC) also presents an encouraging trend. During the pre-cycle, 9 students did not achieve mastery, whereas this number decreased to 5 students in Cycle I. Although the numerical increase appears modest, these results suggest an improvement in student learning outcomes.

Furthermore, during the pre-cycle phase, the total score obtained was 1,944. When divided by the total number of students (25), the average score was 77.76, with a mastery level of only 64%. On the other hand, in Cycle I, the total score increased to 2,000, resulting in an average score of 80.00. This reflects a 16% improvement in the mastery percentage compared to the pre-cycle phase. This outcome signifies a positive achievement in the students' learning process.

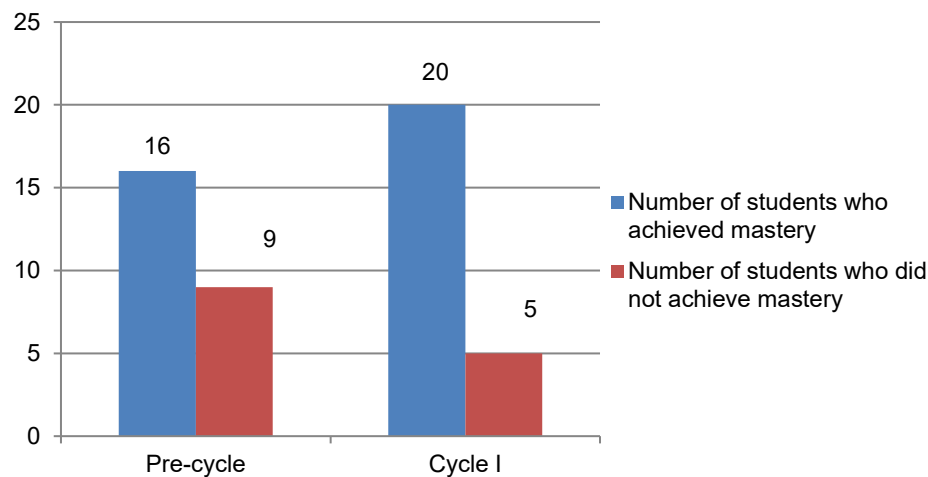


Fig. 1. Comparison Chart of Pre-Cycle and Cycle I Scores

When comparing the initial condition with the outcomes of the first meeting in Cycle I, it can be observed that during the second meeting of the same cycle, the students' learning outcomes demonstrated a significant improvement. Although the percentage difference between the two meetings is relatively small, the change still had a meaningful impact. For further clarity, a comparison of the percentages is presented in the table below.

Table 2. Student Learning Test Results in Cycle I and Cycle II

No.	Indicator	Test Scores		MMC
		Cycle I	Cycle II	
1.	Number of students achieving mastery	20	25	75
2.	Number of students not achieving mastery	5	-	
3.	Total score	2,000	2,152	
4.	Average score	80.00	86.08	
5.	Mastery level	80%	100%	

As presented in the table, the results of the students' learning assessment in Cycle II showed a significant improvement. With the MMC threshold set at 75, the table indicates that the number of students who achieved learning mastery in Cycle II was considerably higher than in the previous cycle. A total of 20 students met the criteria in Cycle I, while approximately 25 students achieved mastery in Cycle II. This reflects a marked improvement in students' test performance in Cycle II. Therefore, it can be concluded that all students successfully completed the learning process in Cycle II. The average score increased from 80.00 in Cycle I to 86.08 in Cycle II. This finding demonstrates that students of Class XI Textile experienced a notable improvement in learning outcomes during Cycle II.

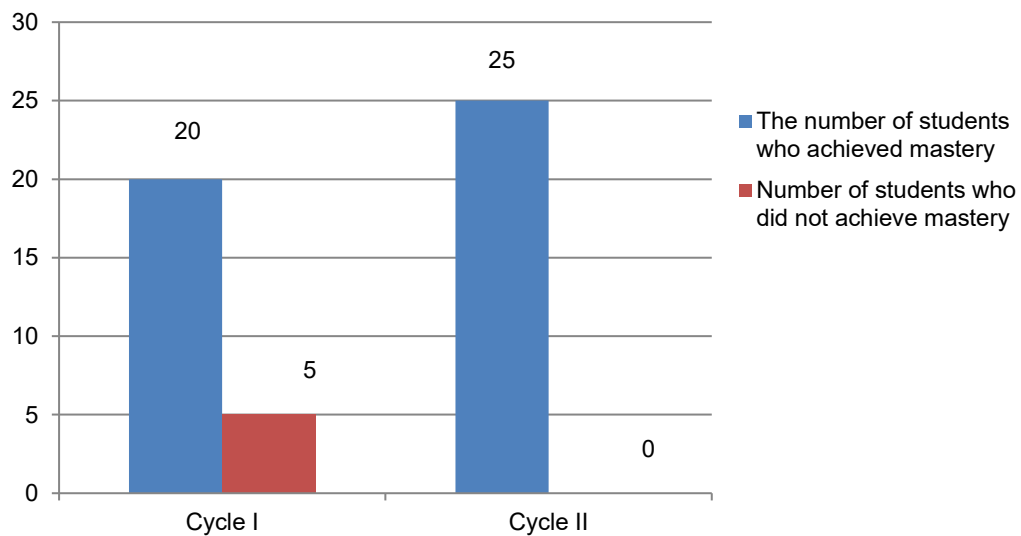


Fig. 2. Comparison Chart of Cycle I and Cycle II Test Scores

Learning outcomes showed improvement across several stages: the pre-cycle stage, the first and second meetings in Cycle I, as well as the first and second meetings in Cycle II. These improvements were observed as a result of the interventions implemented. The following table presents a comparison of students' learning activity scores.

Table 3. Comparison of Students' Learning Activity Percentages

No.	Observed Aspects	Pre-Cycle	Cycle I		Cycle II	
			Session 1	Session 2	Session 1	Session 2
1.	Student readiness to participate in learning	69.56%	80%	91.66%	95.83%	100%
2.	Student enthusiasm during the learning process	52.17%	72%	83.33%	91.66%	100%
3.	Student confidence in asking questions or expressing opinions	30.43%	44%	50%	75%	80%
4.	Student perseverance in completing assigned tasks	65.21%	76%	79.16%	91.66%	100%
Average		54.34%	68%	76.03%	88.53%	95%

Based on the table presented above regarding the comparison results of the four observed aspects during classroom learning activities, from the pre-cycle stage to the first and second meetings of Cycle II, the average percentage at each stage shows consistent improvement. Each phase demonstrated progress, as reflected in the comparison of students' learning activity percentages. The average score for student learning activity in the pre-cycle stage was 54.34%, categorized as moderate. In the first meeting of Cycle I, the average increased to 68%, placing it in the high category, indicating progress in student engagement. Furthermore, in the second meeting of Cycle I, student activity rose to 76.03%, maintaining the high category. In the first meeting of Cycle II, the average activity score

increased significantly to 88.53%, classified as very high, and further improved to 95% in the second meeting, also within the very high category. These findings indicate that student learning activity improved substantially by the second meeting of Cycle II. Therefore, the implementation of project-based learning (PjBL) showed a consistent and planned increase in student learning activity from the pre-cycle through the second meeting of Cycle II. The following diagram illustrates the average percentages mentioned above:

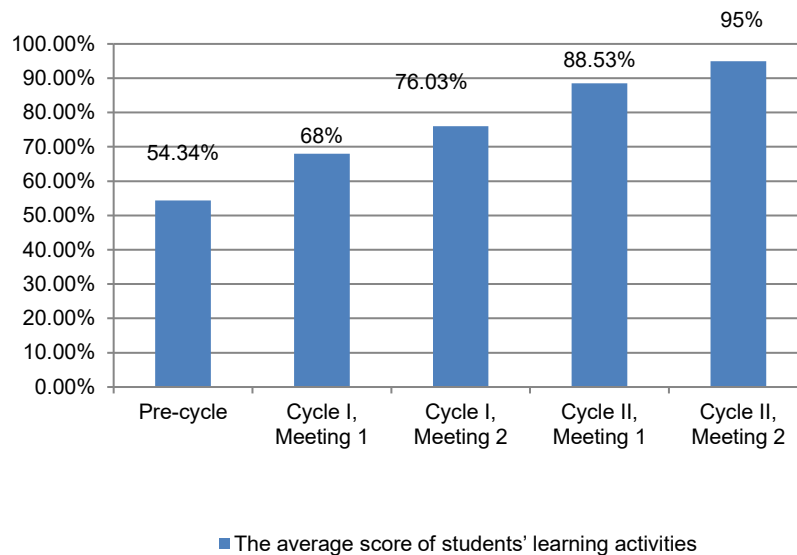


Fig. 3. Diagram of the Comparison of Students' Learning Activity Percentages

The learning process at each stage was conducted in accordance with the strategies developed prior to the implementation of the instructional activities. Although the initial improvements were modest, the results of each cycle demonstrated consistent progress. In the pre-cycle stage, the average student learning outcome score was 77.76. This average increased to 80.00 in Cycle I and further improved to 86.08 in Cycle II. The average scores of students' learning outcomes across the pre-cycle, Cycle I, and Cycle II are presented in the following table.

Table 4. Comparison of Students' Test Score Totals

No.	Indicator	Test Score Average			MMC
		Pre-cycle	Cycle I	Cycle II	
1.	Number of students achieving mastery	16	20	25	75
2.	Number of students not achieving mastery	9	5	0	
3.	Total score	1,944	2,000	2,152	
4.	Average score	77.76	80.00	86.08	
5.	Mastery level (%)	64%	80%	100%	
6.	Lowest score	68	68	76	
7.	Highest score	88	88	96	

Based on the table comparing students' test scores, it can be observed that the initial average score was 77.76. Although this score is already above the minimum mastery criteria (MMC), further efforts were necessary to improve it, as it was still relatively close to the threshold. The following figure illustrates the data presented in the previous table

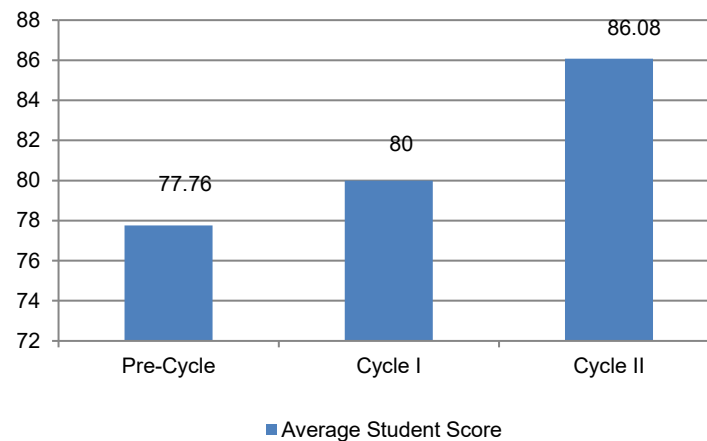


Fig. 4. Diagram of Students' Average Scores in the Pre-Cycle, Cycle I, and Cycle II

The accompanying chart illustrates the rapid increase in students' average scores across each cycle. The average score was 77.76 in the pre-cycle, 80.00 in Cycle I, and 86.08 in Cycle II. The number of students who met or did not meet the minimum passing criteria is shown in the following figure.

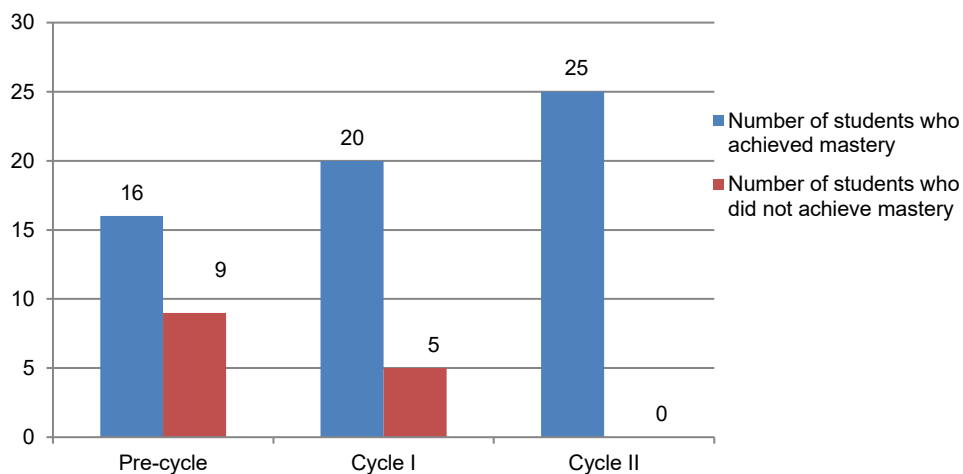


Fig. 5. Diagram of Student Mastery Data in the Pre-Cycle, Cycle I, and Cycle II

Fig. 5 illustrates that a greater number of students achieved the learning objectives in each subsequent cycle, indicating a positive development in students' learning outcomes over time. According to the chart, during the pre-cycle phase, only 16 students achieved the

MMC. This number increased to 20 students in Cycle I and reached 25 students in Cycle II. The graph also provides data on students who did not meet the standard. In the pre-cycle phase, there were 9 students who did not achieve the MMC, while in Cycle I, this number decreased to 5 students. Notably, in Cycle II, all students met the MMC, indicating that every student successfully passed the learning assessment. The following figure displays the percentage of students who achieved the learning standard.

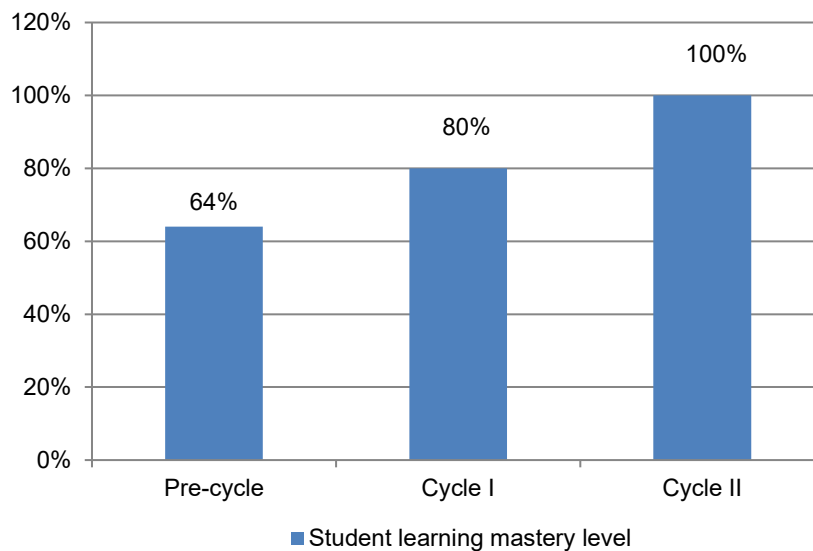


Fig. 6. Diagram of Learning Mastery Percentage in Pre-Cycle, Cycle I, and Cycle II

Based on Fig. 6, the percentage of student mastery in each cycle indicates a progressive improvement in learning outcomes. The learning mastery percentage in the pre-cycle was 64%, increasing to 80% in Cycle I, and reaching 100% in Cycle II. These findings demonstrate that the Project-Based Learning (PjBL) model significantly enhanced students' creativity. The average student score during the pre-cycle was 77.76. This average increased to 80.00 in Cycle I and further to 86.08 in Cycle II after the implementation of PjBL, indicating a substantial improvement in students' creative abilities. This enhancement suggests that students were able to apply their acquired knowledge and skills in real-world contexts. Moreover, the fact that 100% of students met the minimum mastery criteria confirms that all students were able to participate effectively in the learning process.

Students' enthusiasm for the learning process also increased. Based on observations, students who were previously passive began to participate more actively in discussions and practical activities. They became more engaged with one another and demonstrated the ability to collaborate effectively in group settings. This indicates that the Project-Based Learning (PjBL) approach successfully fostered a cooperative and supportive learning

environment. The students' batik creations reflected a high level of creativity, as evidenced by the unique and aesthetically appealing motifs they produced. Each student was able to create distinctive patterns that demonstrated their understanding of flora and fauna concepts. Furthermore, the creative process involved critical analysis of the symbolic meaning behind each motif. As a result, students not only acquired technical skills but also gained foundational cultural knowledge through their work.

Despite the positive outcomes, this study also identified several challenges encountered during the implementation of the Project-Based Learning (PjBL) paradigm. Throughout the project, some students struggled with maintaining concentration and managing their time effectively. This highlights the need for teachers to provide more focused guidance to help students overcome such difficulties. Improved time management strategies and clear task delegation are essential for enhancing the effectiveness of the learning process. Reflections conducted after each cycle offered valuable insights for ongoing improvements. Discussions between the researcher and students helped to identify both the strengths and weaknesses of the PjBL model implementation. Students reported feeling more motivated and enthusiastic when engaged in project-based activities. This suggests that the project-based approach can positively influence students' emotional engagement throughout the learning process.

The findings of this classroom action research are consistent with previous studies that highlight the effectiveness of the Project-Based Learning (PjBL) paradigm in enhancing student motivation and learning outcomes. This approach fosters more meaningful learning experiences by providing students with opportunities to actively engage in the learning process. Furthermore, project-based learning promotes critical and creative thinking—skills that are highly essential in the modern era. Therefore, the implementation of this model is worth considering as an integral part of the art education curriculum.

Overall, this study emphasizes the importance of implementing collaborative and interactive learning paradigms in art education. Project-Based Learning (PjBL) not only fosters students' creativity and social skills but also enhances their academic achievement. With the appropriate approach, students can experience art education in a more engaging and meaningful way. It is hoped that the findings of this study will contribute positively to the advancement of art education techniques, particularly in batik craft.

The following are examples of student work produced by Grade XI Textile students at SMKN 3 Kasihan Bantul throughout the pre-cycle, Cycle I, and Cycle II stages.



Cinta Najwa / Grade XI Textile / Pre-Cycle
(Documentation: Alfi, June 20, 2025)



Afina Kinan Ahaba / Grade XI Tekstil / Pre-Cycle
(Dokumentation: Alfi, June 20, 2025)



Cinta Najwa / Grade XI Tekstil / Cycle I
(Dokumentation : Alfi, June 20, 2025)



Afina Kinan Ahaba / Grade XI Textile / Cycle I
(Documentation: Alfi, June 20, 2025)



Cinta Najwa / Grade XI Textile / Cycle II
(Documentation: Alfi, June 20, 2025)



Afina Kinan Ahaba / Grade XI Textile / Cycle II
(Documentation: Alfi, June 20, 2025)

Fig. 7. Student Art Products

Conclusion

Based on the research findings and discussion, it can be concluded that the use of the Project-Based Learning (PjBL) model in the batik craft subject specifically in producing batik handkerchiefs has successfully enhanced students' learning creativity significantly. Student enthusiasm and perseverance in completing tasks showed notable improvement

throughout the pre-cycle, Cycle I, and Cycle II stages. The average student score increased from 77.76 in the pre-cycle to 86.08 in Cycle II, as all students met the minimum mastery criteria. Project-Based Learning (PjBL) created a more dynamic learning environment by fostering collaboration and creativity among students, in addition to improving academic outcomes. The classroom action research conducted in Grade XI Textile class proceeded smoothly and demonstrated consistent progress.

The preparation for batik craft learning, despite facing limitations in tools and materials, proceeded smoothly due to thorough planning. Clear and comprehensive planning including methods, materials, tools, resources, and instructional strategies proved essential in ensuring that the research was conducted in a structured and effective manner. The planning data encompassed objectives, strategies, time allocation, and research setting. The instructional process of making batik handkerchiefs using wax (malam) and Remazol dye was successfully implemented, resulting in measurable outcomes and significant improvement in the targeted aspects.

The learning process of handkerchief batik making using the project-based learning (PjBL) model was carried out according to schedule and proceeded smoothly. This approach clearly enhanced students' enthusiasm, active participation, confidence in asking questions and expressing opinions, as well as their perseverance in completing tasks. These outcomes indicate the effectiveness of PjBL in fostering students' creativity, leading to a notable increase in their creative capacity.

The students' batik works exhibited consistent improvement at each stage of the intervention. During the pre-cycle stage, several deficiencies were identified in the creation of batik motifs. However, in Cycle I, students managed to improve across all assessed aspects, and in Cycle II, the emphasis on enhancing student creativity led to optimal outcomes. The average student score increased from 77.76 with a 64% mastery rate (categorized as high) in the pre-cycle stage, to 80.00 with an 80% mastery rate (very high category) in Cycle I, and further improved to 86.08 in Cycle II. The classical mastery level reached 100% in Cycle II, indicating a very high level of achievement.

Therefore, to enhance students' creativity and overall learning outcomes, it is highly recommended that the project-based learning approach be implemented in batik craft instruction as well as in other art-related subjects.

Limitations and Suggestions

This study encountered several limitations that should be taken into consideration. First, the number of research subjects was limited to only 25 students, which may not be sufficiently representative. Second, the availability of the batik practice space was restricted due to its concurrent use as a final project studio for twelfth-grade students. Third, the limited timeframe for data collection affected the optimality of the results. Lastly, environmental factors such as weather conditions influenced both student concentration and the batik-making process. Awareness of these limitations is crucial for future researchers to design more comprehensive studies and to develop more effective instructional methods.

Based on these limitations, the following recommendations are proposed for future research: (1) expand the number of participants by involving students from various classes to improve the representativeness of the findings; (2) allocate a more flexible schedule to allow deeper exploration of learning outcomes; (3) optimize the availability and functionality of practice spaces to ensure uninterrupted learning activities; and (4) adopt teaching strategies that can minimize the impact of external factors such as weather.

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