



# Enhancing Javanese Script Learning through Surabaya Batik Puzzles

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**Abstract.** Learning regional languages, especially Javanese, is crucial in preserving Indonesia's cultural wealth and linguistic diversity. However, at SMPN 19 Surabaya, teaching Javanese, particularly script material such as Aksara Swara and Aksara Murda, often needs more student motivation and interest. An innovative approach is required to address this issue and enhance student participation and understanding. One proven effective method is the Project-Based Learning (PjBL) model. This practice was implemented in class VIII-F during the even semester of the 2023/2024 academic year with the primary goal of increasing motivation to learn Javanese and understand the Javanese script through Batik Puzzle media. This approach was designed to introduce the unique batik motifs of Surabaya while simultaneously reviving student interest in the Javanese script by making learning more interactive and relevant and implementing Batik Puzzle in project-based learning at SMPN 19 Surabaya involved activities where students assembled puzzles combining Surabaya's distinctive batik motifs with the writing of Javanese script, utilizing digital media to enhance engagement. The results demonstrated a significant increase in student motivation, participation, and comprehension of Javanese script. Before adopting Project Based Learning (PjBL) using Batik Puzzle, the average score of class VIII-F students was 60.8. Following the implementation of PjBL, their average score increased to 86.3. This indicates that using Batik Puzzle effectively enhances student motivation and understanding of Javanese script. This article explores how this approach was designed and implemented and its impact on student motivation and comprehension.

**Keywords:** Javanese Script, Batik Puzzle, Project Based Learning

## 1 Introduction

Regional languages are vital to Indonesia's cultural richness, preserving both linguistic heritage and local identity. With its historic and meaningful script, the Javanese language holds significant cultural value. Despite its significance, learning the Javanese script poses challenges, especially in the modern digital era. The script's complexity and various similar letter forms make it difficult for students to distinguish and learn, particularly in reading and writing. This difficulty is compounded by traditional teaching methods requiring more innovation, leading to a monotonous and disengaging learning experience [7][4].

As education advances, the demand for innovation and creativity in creating an engaging learning environment grows. Educators must move beyond traditional lectures to meet contemporary educational needs. The use of learning media, such as graphic, photographic, electronic, and digital tools, plays a vital role in effectively processing and presenting information. In the current technological era, integrating these innovative media is crucial, highlighting the importance of educators' proficiency in utilizing technological advancements [10][2].

The project-based learning (PjBL) model is an innovative, student-centered approach that positions teachers as motivators and facilitators, allowing students to take charge of their own learning. This method incorporates project work to foster critical thinking through tasks centered around questions and problems, encouraging students to seek solutions. The PjBL model has proven effective in various contexts, such as in-class VIII-F at SMPN 19 Surabaya, where Batik Puzzle media is used to teach the Javanese script while integrating local cultural values through Surabaya batik motifs [11][14].

Previous research has explored various innovative media for teaching the Javanese script. One such media is the Ropantar (spinning arrow wheel), which has been validated as effective for grade IV students but requires considerable space and storage [8]. Another example is Hanacaraka, a website-based tool that covers Javanese script history, types, and fonts and has proven effective in supporting Javanese script education [5]. Additionally, a website-based learning medium featuring multiple-choice and descriptive questions, aligned with traditional Javanese textbooks, has also been developed [9].

These studies highlight ongoing efforts to improve Javanese script education through various physical and digital media. This research advances the field by assessing the effectiveness of integrating Project-Based Learning (PjBL) with Batik Puzzle media for junior high school students, offering new insights into innovative and effective teaching strategies. It aims to enhance students' motivation and comprehension of Javanese script, contributing to the development of novel and practical educational approaches for revitalizing Javanese script instruction in schools.

## 2 Research Methods

This qualitative case study at SMPN 19 Surabaya involves 35 eighth-grade students aged 13-14 from diverse cultural backgrounds. The research aims to explore the implementation of the Project-Based Learning (PjBL) model integrated with Batik Puzzle media to enhance students' motivation and understanding of the Javanese script. Project-Based Learning (PjBL) has been shown to effectively engage students in meaningful learning experiences by allowing them to explore real-world problems and challenges [6][3]. Data collection includes diagnostic tests using Quizizz, a platform recognized for its ability to enhance student engagement through interactive quizzes [13]), observations of learning styles and student interests, and learning projects conducted over three cycles.

The first cycle includes diagnostic tests and initial observations; the second cycle features an online flashcard game using Baamboozle, another gamified learning tool

that has proven effective in reinforcing student knowledge [15], and a group project on the Javanese script and Surabaya batik motifs through the official Instagram account of the Surabaya city Government. Incorporating traditional cultural elements like the Javanese script and Surabaya batik into modern educational activities not only preserves these cultural assets but also increases students' cultural literacy and appreciation [12][1]. The third cycle involves the completion of Javanese script writing and batik puzzles. A final knowledge test assesses students' understanding after the project's completion. Data analysis employs descriptive qualitative techniques to provide detailed insights, following the stages of preparation, implementation, analysis, and reporting.

### **3 Results and Discussion**

#### **3.1 Initial Diagnostic Test Results**

The initial diagnostic test was conducted at the beginning of the learning process (cycle 1) to assess the students' initial knowledge of basic Javanese script. This test utilized the Quizizz application. The diagnostic test results indicated that the students' average initial understanding of basic Javanese script was 60.8, with the highest score being 90 and the lowest score being 40. Most students (20 out of 35) scored below or equal to 60. This indicates that the students still need to gain a higher level of knowledge of basic Javanese scripts.

#### **3.2 Description of PjBL Implementation with Batik Puzzle**

The implementation of the Project-Based Learning (PjBL) model integrated with Batik Puzzle media was carried out in three cycles. Each cycle had different focuses and learning activities to gradually develop students' motivation and understanding.

**Cycle 1.** In Cycle 1, the teacher conducted an initial diagnostic test and preliminary observations to understand the learning styles and characteristics of the students in classes VIII-F. The diagnostic test, administered through the Quizizz application, aimed to identify the student's level of understanding of Javanese script material, while the initial observations sought to determine the student's learning styles and characteristics.

The diagnostic test results indicated that most students needed to grasp the Javanese script material well. The observations revealed that the majority of students exhibited a kinesthetic learning style. Based on the diagnostic test and observation results, the teacher designed learning activities aligned with the student's learning styles using an online flashcard game via the Baamboozle application. This online flashcard game was designed to help students understand and memorize the Javanese script engagingly and interactively.

**Cycle 2.** At the beginning of Cycle 2, students were given an online flashcard game through the Baamboozle application. This game aimed to help students understand and memorize the basic Javanese script.



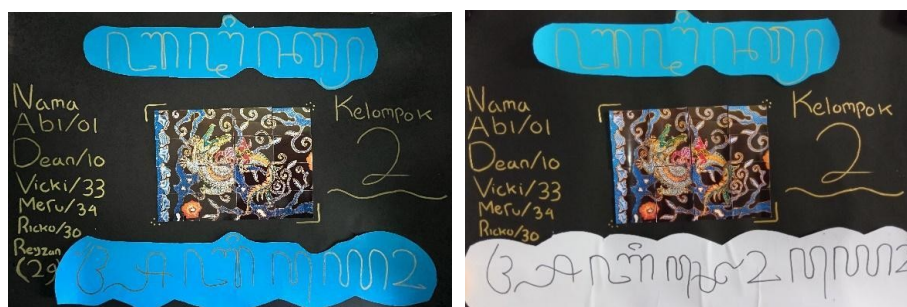
of project completion, either starting with the puzzle or writing the name of a batik motif on a piece of paper.



**Fig. 3.** Implementation of Javanese Script Writing and Batik Puzzle Project by Students of Grade VIII-F SMPN 19 Surabaya

Upon completing the Javanese script writing project, the teacher explained the significance and philosophy behind the batik motifs that the students had inscribed. The discussion covered the origins of the batik motifs, their symbolism, and their cultural values.

After the lesson, the teacher provided feedback on the students' projects, particularly addressing any errors in the Javanese script. The teacher carefully reviewed the students' writing and returned it to them for revision, offering guidance on correcting the mistakes.



**Fig. 4.** Javanese Script Writing Project Outcomes Before and After Teacher Feedback

Following the completion of their projects and the receipt of feedback, a selection activity was conducted to identify the best works. This activity was designed to motivate students to invest more effort in their projects and to acknowledge those who

produced exceptional work. Below are the best works from the Javanese script writing and batik puzzle projects.



**Fig. 5.** Outstanding Outcomes of the Javanese Script Writing Project and Batik Puzzle by Students of Grade VIII-F SMPN 19 Surabaya

### 3.3 Final Knowledge Test Results

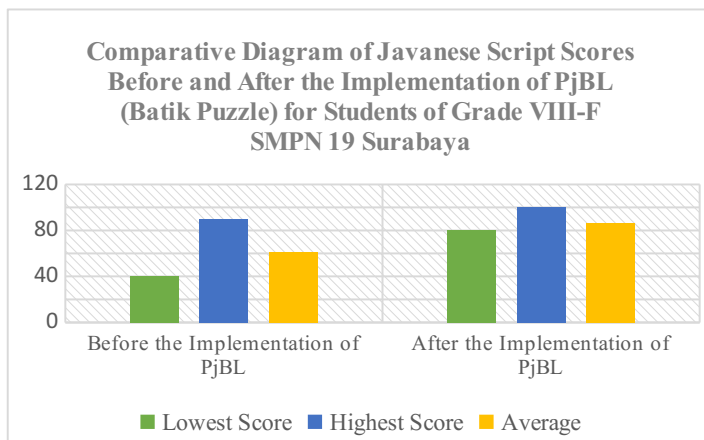
The final knowledge test was conducted after completing the learning project to assess the students' understanding of the Javanese script material. The test results indicated that the average final knowledge score of the students was 86.3. The highest score achieved was 100, while the lowest score increased to 80. A comparison between the initial diagnostic test and the final knowledge test showed an improvement of 25.5 points, indicating that using Batik Puzzle media in Project-Based Learning (PjBL) effectively enhanced students' understanding.

**Table 1.** Comparison of Javanese Script Scores Before and After the Implementation of PjBL (Batik Puzzle)

| Grade         | Frequency (fii)                   |                                  |
|---------------|-----------------------------------|----------------------------------|
|               | Before the Implementation of PjBL | After the Implementation of PjBL |
| ≤60           | 20                                | 0                                |
| 70            | 4                                 | 0                                |
| 80            | 3                                 | 23                               |
| 90            | 4                                 | 12                               |
| 100           | 0                                 | 1                                |
| Average       | 60.8                              | 86.3                             |
| Highest Score | 90                                | 100                              |
| Lowest Score  | 40                                | 80                               |

### 3.4 Discussion

The research findings indicate that implementing Project-Based Learning (PjBL) integrated with Batik Puzzle media effectively enhances students' motivation and understanding of Javanese script. Prior to the implementation of PjBL, the average score of students in class VIII-F was 60.8, with the highest score at 90 and the lowest at 40. Following the implementation of PjBL, the average score increased to 86.3, with the highest score at 100 and the lowest at 80. No students scored below 70 after the implementation of PjBL. The diagram below illustrates the comparison of Javanese script scores before and after the implementation of PjBL among students of class VIII-F at SMPN 19 Surabaya.



**Fig. 6.** Comparison of Javanese Script Scores Before and After the Implementation of PjBL (Batik Puzzle)

The diagram shows that students' highest, lowest, and average scores significantly improved after implementing PjBL with Batik Puzzle media. This improvement indicates that innovative teaching methods such as PjBL integrated with engaging media can dramatically enhance students' motivation and understanding. These findings are significant, as they underscore the effectiveness of innovative teaching strategies in promoting student engagement and understanding. Educators can create a more dynamic and stimulating learning environment by integrating project-based learning with interactive media. This approach not only fosters critical thinking and problem-solving skills but also nurtures a deeper appreciation for cultural heritage, such as the Javanese script.

Furthermore, the positive outcomes of this study contribute to the broader educational discourse on effective pedagogical practices, particularly in the context of regional language instruction. As educators increasingly seek to adapt to modern teaching demands, the findings of this research provide valuable insights into how innovative methods can be employed to revitalize the teaching of Javanese script. This study not only highlights the potential for enhanced student outcomes but also

emphasizes the importance of incorporating culturally relevant materials into the curriculum to facilitate meaningful learning experiences.

## 4 Conclusion

The research showcased the effectiveness of incorporating Project-Based Learning (PjBL) with Batik Puzzle media to improve students' motivation and understanding of the Javanese script. Data analysis indicated a significant enhancement across all metrics after adopting this approach. Before the PjBL integration, students achieved an average score of 60.8, with scores ranging from 40 to 90. Following the implementation, the average score notably rose to 86.3, ranging from 80 to 100. The engaging and visually stimulating nature of Batik Puzzle media played a crucial role in creating a dynamic learning environment, leading to increased student engagement and collaboration. Furthermore, digital tools such as Quizizz and Baamboozle created an interactive atmosphere conducive to learning. However, it's important to note that the study's applicability is limited due to its focus on a single class in a single school, which calls for careful consideration when applying these findings broadly. Future research should involve longer study durations to evaluate sustained impacts on student motivation and comprehension. In summary, this research highlights the potential of integrating Batik Puzzle media into PjBL as an innovative strategy to rejuvenate Javanese script education, laying the groundwork for developing effective and creative pedagogical approaches.

**Acknowledgments.** The inception and design of this research were led by Nastiti I. A. Thifali. Anggrika F. Pratiwi conducted observations during the research. Yoga Pamungkas, Fahrizal Gustama, and Widigdo D. Nugroho participated in analyzing and interpreting the research findings. Octo D. Andriyanto guided the students in drafting the manuscript. Sulatun served as a source of inspiration. All authors provided essential feedback and significantly contributed to the manuscript's research, analysis, and development.

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