

## **Project-Based Learning Strategies To Optimize The Intellectual Intelligence Of Elementary School Students**

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### **ABSTRACT**

*In the 21st century, civilization and technology are increasingly advanced, so students need more than just theoretical abilities; they need to develop creative and innovative skills that can balance the abilities required for the future. Project-based learning emerged as one of the effective alternatives, which provides opportunities for students to be directly involved in real experiential learning and allows them to apply what they have learned to various conditions in their daily lives. Therefore, this study aims to explore how the application of project-based learning can optimize the intellectual intelligence of elementary school students, especially class V-B cultural arts and crafts (SPdP) material for making Batik jumpat Tangan. This method uses a qualitative descriptive approach with informants, namely class teachers and V-B students of SDN Dadaprejo 01. Data were collected through observation, interviews, and documentation. The results showed that a series of project-based learning strategies were considered to support the development of students' intellectual intelligence. This is reflected in students' involvement in activities, actively discussing and completing tasks in project-based learning. Students' increasing interest in learning and thinking is reflected in their increasing curiosity and critical questioning during the learning process, corroborated by teachers' and students' observations and impressions from interviews. This has a positive impact on their academic achievement and equips them to face future educational challenges.*

**Keywords:** Project Based Learning; Intellectual Intelligence; Elementary School

### **ABSTRAK**

Di era abad 21 peradaban dan teknologi semakin maju, sehingga siswa perlu memiliki kemampuan yang lebih dari sekedar teoritis, tetapi perlu mengembangkan kemampuan kreatif dan inovatif yang mampu menyeimbangkan kemampuan yang dibutuhkan dimasa depan. Pembelajaran berbasis proyek muncul sebagai salah satu alternatif yang efektif, yang memberikan kesempatan kepada siswa

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untuk terlibat langsung dalam pembelajaran pengalaman nyata dan memungkinkan mereka untuk menerapkan apa yang telah mereka pelajari ke dalam berbagai kondisi di kehidupan sehari-hari. Oleh karena itu, penelitian ini bertujuan untuk mengeksplorasi bagaimana penerapan pembelajaran berbasis proyek dapat mengoptimalkan kecerdasan intelektual siswa sekolah dasar khususnya kelas V-B mata pelajaran Seni Budaya dan Prakarya (SBdP) materi Pembuatan Batik Jomput Tangan. Metode ini menggunakan kualitatif pendekatan deskriptif dengan informan yaitu guru kelas dan siswa V-B SDN Dadaprejo 01. Data dikumpulkan melalui observasi, wawancara dan dokumentasi. Hasil penelitian menunjukkan bahwa serangkaian strategi pembelajaran berbasis proyek dianggap mendukung pengembangan kecerdasan intelektual siswa. Hal ini tercermin dari keterlibatan siswa dalam kegiatan, berdiskusi secara aktif, dan menyelesaikan tugas dalam pembelajaran berbasis proyek. Minat belajar dan berpikir siswa yang semakin meningkat tercermin dari meningkatnya rasa ingin tahu dan pertanyaan kritis mereka selama proses pembelajaran, yang dikuatkan oleh hasil pengamatan dan kesan guru dan siswa dari wawancara. Hal ini tidak hanya berdampak positif pada prestasi akademik mereka, tetapi juga membekali mereka untuk menghadapi tantangan pendidikan di masa depan.

**Kata Kunci:** Pembelajaran Berbasis Proyek; Kecerdasan Intelektual; Sekolah Dasar

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## INTRODUCTION

Education is an important foundation in shaping individuals' character and intellectual intelligence from an early age, especially at the primary school level. In the current era of globalization and technology, education not only serves as a transfer of knowledge but also as a means to shape the character and critical skills needed to face future challenges (Indriyani et al., 2023). Teaching strategies that emphasize academic skills and the development of 21st-century skills, such as critical thinking, teamwork, and creativity, are indispensable in facing the increasingly complex challenges of the 21st century (Nursalam et al., 2023). Innovative learning methods such as project-based learning are important to implement (Jamil, 2023). This method encourages cognitive development and equips them with creative and innovative skills to face future challenges (Rizkasari et al., 2022).

In Howard and Gardner's theory of multiple intelligences, one aspect of intelligence is understood as an intellectual ability that focuses on using logic to solve problems (Syarifah, 2019). This theory supports a project-based learning approach as this method provides opportunities for students to develop multiple intelligences that are highly relevant to the needs of the 21st century (Priyambodo, 2020). Although intellectual intelligence is not explicitly explained in Gardner's theory, this concept is still relevant because it is related to intellectual intelligence. Intellectual intelligence is a person's ability to understand, reason, acquire knowledge, and solve problems (Wang et al., 2022). Intellectual intelligence is closely related to the cognitive skills of each person. (Putriana et al., 2021) Intellectual intelligence in elementary school refers to students' ability to think critically, understand basic concepts of subjects, solve problems, and apply their knowledge in daily life.

In implementing learning in the classroom today, many teachers still rely on the lecture method by explaining material on the blackboard without actively involving students in the learning process (Armana et al., 2020). This situation often makes students feel bored and less motivated, as they are only given concepts to imitate without the opportunity to participate directly or discuss. In addition, this approach is different from the modern learning paradigm, which emphasizes the importance of active student involvement in the learning process (Thaariq et al., 2023). The conventional approach that lacks student involvement is a challenge

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that encourages the need to apply project-based learning methods. Students are allowed to be directly involved in projects related to the material being studied so that they can understand and apply these concepts in everyday life.

With the implementation of the independent curriculum, students are expected to be able to develop critical thinking skills, creativity, and scientific knowledge, therefore, a learning model is needed that is not only creative and innovative but also able to create a pleasant learning atmosphere and attract students to continue learning and increase their involvement in the learning process (Nadhiroh & Anshori, 2023). The independent curriculum provides freedom in designing learning, emphasizing the importance of creativity from teachers and students (Fadhli, 2022). Project-based learning is emerging as an effective alternative. It allows students to be directly involved in real experiential learning and allows them to apply what they have learned to various conditions in everyday life (Rianto et al., 2023). Project Based Learning is a learning model that engages students in meaningful tasks such as problem-solving and other activities by making projects the core of learning (Mayuni et al., 2019). In a student-centered learning process, they are invited to participate in working on or creating a project, so this activity allows students to develop their creativity (Nuraeni et al., 2023). By utilizing project-based learning, all learning styles can be accommodated well, and this approach can also be a forum for students' various learning styles (Pratiwi et al., 2024). Not only intellectual intelligence related to academic aspects can be improved, but also student attention in the classroom, thus creating a more pleasant and enjoyable learning atmosphere (Perayani & Rasna, 2022).

Through the interviews at SDN Dadaprejo 01, the researcher concluded that project-based learning can support the development of intellectual intelligence in elementary schools, especially in the subject of Seni Budaya dan Prakarya (SPdP) in class V-B. The informant added that although each child has different abilities, project-based learning at least contributes to improving students' creativity and activeness. Even though, the improvement may look small in terms of overall intellectual intelligence. However, this shows that this learning method has the potential to help students develop skills, as per the perceptions expressed by teachers and students.

Previous research conducted by (Musa'ad et al., 2024), showed that project-based learning significantly influences students' critical thinking skills between conditions before and after applying the method. This is in line with research conducted by (Guswanti, 2024), which reveals that project-based learning methods can improve children's cognitive abilities. Followed by research conducted by (Sumarni, 2020), showed that project-based learning can improve student learning activities and outcomes, and most importantly, students do not feel bored and bored in following the learning process.

Previous research has shown improvements in critical thinking, cognitive skills, and general learning outcomes. Still, no research has yet to comprehensively explore the gap in understanding how and why project-based learning can profoundly impact various aspects of intellectual intelligence. This research seeks to fill the gap in the literature by exploring in depth how project-based learning can facilitate and optimize students' intellectual intelligence. The novelty of this research lies in the comparative analysis of previous research results on project-based learning. The comparison of various research results can provide a more comprehensive

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perspective, and the emphasis on specific age groups and research locations can add value to the research novelty.

This research aims to explore how the implementation of project-based learning can optimize the intellectual intelligence of elementary school students. It is expected to provide deep insight into how project-based learning strategies are implemented in the context of school education to optimize students' intellectual intelligence, which can be used to improve teaching methods and the quality of education in the school environment.

## **METHODS**

### **Type and Design**

This research uses a descriptive approach to the qualitative method. A descriptive qualitative method is an approach that aims to describe and understand phenomena in depth in the form of a series of words or writings (Rifa'i, 2023). Qualitative research seeks to gain a deep understanding of issues related to humans and social dynamics by exploring the perspectives, experiences, and contexts behind these phenomena (Fadli, 2021).

### **Data and Data Sources**

This research was conducted at SDN Dadaprejo 01, Batu City, East Java, in the academic year 2024/2025, even a semester of Seni Budaya dan Prakarya (SBdP) batik jumput tangan material. The subjects in this study were all class V-B SDN Dadaprejo 01 students, totaling 30, consisting of 17 male students and 13 female students. In addition, the research involved the V-B class teacher as the primary information who is experienced in implementing project-based learning methods. The object of this research is to explore how implementing project-based learning can optimize the intellectual intelligence of elementary school students.

### **Data collection technique**

Data collection techniques used in this study include several methods, namely observation, interviews, and documentation. The observation method was used to find out the actual situation in class V-B SDN Dadaprejo 01, including observing the learning process, the interaction between teachers and students, and student activeness. The researcher also paid attention to class dynamics, students' responses to tasks, and their involvement in group discussions or presentations. The interview method was used to explore the perceptions and experiences of teachers and students regarding the implementation of project-based learning and its impact on students' intellectual intelligence. Interviews were conducted in-depth with some purposively selected students, as well as with teachers who are experienced in implementing this method. The documentation method was also used to support the records. The researcher described all events in the field without intervening in the data collection process involving teachers and students.

### **Data analysis**

To gain a thorough understanding, the data collected in the study must be analyzed before being presented. Qualitative data reflects the actual situation and is not reduced to numbers so it can capture the complexity and nuances of the phenomenon under study (Sarosa, 2021). This study uses the Miles & Huberman flow, starting with data collection through various

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techniques followed by relevant data reduction using coding to group specific themes, then presenting the data structured to facilitate drawing conclusions (Susanto & Jailani, 2023). To increase the validity of the data, researchers used triangulation. Source triangulation was carried out by comparing results from interviews with teachers and students to ensure the consistency of findings. In addition, triangulation techniques are used by utilizing various data collection techniques, such as interviews, observation, and documentation, to verify whether the results obtained support each other and are not affected by bias from one technique alone (Alfansyur & Mariyani, 2020). which consists of several methods: data collection, data reduction, data presentation, and conclusion drawing/verification (Susanto & Jailani, 2023).

## RESULTS AND DISCUSSION

Students in class V-B of SDN Dadaprejo 01 generally show good intelligence, characterized by suitable analytical skills, a quick grasp of basic subject concepts, problem-solving skills, and prominent critical and creative thinking skills. In addition, students are curious and ask questions in learning, indicating a high interest in learning and thinking. This is reflected in their ability to carry out the activities well, activeness in class discussions, and high-quality completion of assignments. In addition, students also show great curiosity, often asking in-depth questions during learning, which reflects high learning interest and developed thinking ability. Through this project, students develop critical thinking skills and creativity and prepare themselves to face future academic challenges, which shows that project-based learning can optimize intellectual intelligence.

Project-based learning is one of the alternatives that can develop various intellectual intelligences of students; this learning provides space for students to explore fundamental problems, design solutions, and implement ideas through projects as final products. In this context, project-based learning provides opportunities for students to apply the knowledge they learn to real situations. By Gardner's Theory, which emphasizes the development of logical-mathematical linguistic, kinesthetic, and interpersonal intelligence, this is in line with the results of research showing that students more readily understand basic concepts and critical thinking through Project Based Learning, the model helps students hone analytical abilities and skills. Project-based learning can facilitate students' conducting research, solving problems, and creating work or products based on the project results (Sugestiana, 2023).

Teachers strategize by first identifying the learning objectives and goals, including using the batik jumpit tangan material to foster creativity, critical thinking, and awareness of local culture. Next, teachers explore students' interests and need to ensure learning becomes more interesting and relevant. After that, teachers design learning materials and activities that support these objectives. Teachers then create learning materials, and project-based learning is chosen as it can effectively combine theory and practice and actively engage students in meaningful and collaborative learning (Y. D. Kurino & Herman, 2023).

To optimize the intellectual intelligence of students in class V-B, especially in the subject of Seni Budaya an Prakarya (SPdP), the strategy of using projects as the main focus; with this, students have the opportunity to learn practically and actively participate in the process, and develop their intellectual intelligence, including creativity, critical thinking, and problem-solving skills. Next, in the collaboration strategy, students work together in groups, share knowledge, and support each other to understand the material. The teacher poses questions to

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each group, with prepared students answering and unprepared students learning from their peers. This collaboration accelerates understanding and increases student confidence. Simulation strategies and using videos that illustrate the steps of making products, help students understand concepts more concretely, not only through writing. Finally, presenting the project results allows students to improve their communication skills and take responsibility for the project.

After these learning strategies, teachers follow the absolute project-based learning syntax, which consists of 6 systematic stages to ensure effective project implementation and achievement of learning objectives. There are six syntaxes (Wardani & Pangesti, 2023). First, determining the central question or problem where in this stage is the main stage, the teacher starts with "Who at home has batik?" the teacher introduces students to various typical batik designs from multiple regions. The teacher also asks students to read aloud related to the material displayed. This step can increase students' intellectual intelligence because they are encouraged to think critically and understand local culture more deeply. Introducing students to various batik designs and techniques and presenting sparking questions that have been specially prepared to stimulate students' critical thinking and creativity, directly related to the material to be learned. Understanding the material depends mainly on intellectual intelligence, and discussion can strengthen this understanding (Rockhim et al., 2023).

The second step is planning the project. At this stage, students are divided into groups; in this case, students are required to apply logical and creative abilities simultaneously. The teacher then introduces the hand-painted batik technique so that students can understand the flow and preparation needed before starting the project. Group formation helps students communicate ideas and listen to other's perspectives, which can improve cognitive intelligence and hone in on students' verbal communication skills. Group formation can improve students' verbal communication skills (Akbar et al., 2022).

Third, make a schedule for completing the project. At this stage, students have started the project with the guidance of the teacher, who directs the course of the project and makes an agreement to complete the project. Some projects may still need to be completed at school so that students can continue completion at home. However, in Seni Budaya dan Prakarya (SBdP) subjects, especially hand-dyed batik material, the entire project process is carried out at school to ensure objective assessment and avoid outside involvement. The schedule for completing the hand-knotted batik project is very carefully planned, considering each step, including pattern making, coloring, and drying. At this stage, students also recorded each step of the work accordingly to ensure the process was structured, which supported the development of an in-depth understanding of the concept. In this process, students use their analytical skills to understand stages such as drawing patterns, folding, and tying fabrics with specific techniques.

Fourth, monitor the progress of project completion. At this stage, the teacher continues to guide and facilitate students in completing the project, such as continuing to the next step in making hand-dyed batik, namely the coloring and drying process. Each group took turns dipping the fabric patterned into the dye, then proceeded with the drying process to complete the coloring stage neatly and structurally. In between the projects, the teacher also asks questions, such as "Why do we use hot water in coloring?" directly related to the process to help students deepen their understanding. At this stage, the Lembar Kegiatan Peserta Didik

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(LKPD) is also distributed and worked on in groups to test the results with the various stages of making that have been carried out. This allows students to improve logical thinking, problem-solving, and conceptual understanding.

The fifth is presenting and testing the results of project completion. At this stage, as written, the main focus is to present the results of the completed project. Each group takes turns coming forward; the teacher guides the group presentation by giving each group enough time. Then, the teacher asks other groups to respond or comment on the presentations that have taken place. This process allows the exchange of ideas and stimulates students' intellectual intelligence by encouraging them to analyze and evaluate the results of their friends' projects. In the process of responding, individuals must understand information that can improve critical thinking skills (Pertiwi, 2023). In the final stage, evaluation and reflection, the teacher holds a class discussion to identify difficulties or challenges students faced during the project. The teacher uses an assessment rubric to assess or evaluate students' skills. Through this evaluation and reflection stage, the teacher can determine the extent to which the learning objectives are achieved (Utomo et al., 2024).

In project-based learning about batik in grade 5, students are guided through several stages of making hand-drawn batik. Students follow pattern-making and tie it using rubber containing marbles during the rubber-containing process. Next, in the coloring process, they learn to use hot water, fabric types, and dyes (A. Kurino, 2022). Students may encounter problems such as dye run-off, so they must analyze the causes, try different solutions, and experiment with various techniques to overcome them. All of this aims to support the development of critical thinking, concept understanding, creativity, and problem-solving. This project-based learning process encourages them to actively seek additional information and learn from experience, thus increasing their motivation and engagement in learning activities in the classroom (Sholeh et al., 2024).

The Interviews conducted during this project-based learning process have a positive perception of the development of students' intellectual intelligence. During the implementation of project learning in the classroom, students showed enthusiasm during the learning process. From interviews related to class V-B students, project-based learning is more fun and engaging than conventional methods, which are often considered monotonous. With students' involvement in project-making activities, learning can take place more interactively and interestingly, thus creating an exciting and not dull learning atmosphere while encouraging students to participate more actively, collaborate, and innovate in every step of their learning process.

Project-based Learning accommodates diverse student abilities with flexibility and adaptation so that all students can participate actively. Teachers assist struggling students and give freedom to those who are more capable of exploring. Heterogeneous groups are also applied, with different abilities in one group but assigned roles, which makes all group members active. With the proper support, PjBL allows each student to fully develop their intellectual potential.

Every process has supporting and inhibiting factors that play an important role in determining the success or failure of a process (Reski, 2024). This is in line with the concept of learning, which states that learning outcomes are influenced by internal factors that come from oneself and external factors that come from the environment (Putri, 2023). The supporting

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factors that influence the improvement of intellectual intelligence through intellectual-based learning are expressed by informants, such as student interest and student enthusiasm in the learning process, which is shown by interest in the topics studied. Meanwhile, teacher competence becomes the central axis that guides and directs learning experiences and adequate resources such as media devices, books, and others. Because limited resources and facilities are often challenging for educational institutions (Pratidhina et al., 2020). Increased professional competence and teacher experience can significantly improve student learning ability (Wuisang et al., 2022). Student interest and enthusiasm drive active engagement and deep understanding of the material being taught.

Some inhibiting factors can lead to obstacles and failure of a process. Informants revealed that inhibiting factors include teachers facing difficulties in assessing student participation and assessing contributions to assignments. In addition, although parental involvement is essential, it can be difficult to assess students. Inappropriate involvement can make it difficult for teachers to evaluate students' abilities and participation in the project. Excessive parental involvement can prevent students from learning independently and disrupt the teacher evaluation process (Damayanti et al., 2024). another barrier in optimizing intellectual intelligence lies in the different abilities that each child has. This difference also causes diverse learning outcomes, which ultimately affects the effectiveness of learning. These differences impact individual achievement so each student cannot reach the maximum potential of intellectual intelligence.

## CONCLUSION

Based on research at SDN Dadaprejo 01 related to project-based learning strategies to optimize intellectual intelligence in grade V-B students, project-based learning can contribute to developing the intellectual intelligence of elementary school students. Through this approach, students can design, implement, and present innovative projects related to the material studied. Students are not only trained to master academic materials but also develop critical thinking, problem-solving, and creativity skills. Project-based learning also facilitates the development of other multiple intelligences, such as interpersonal, kinetic, etc. Thus, this study supports future research, especially in exploring the sustainable application of PjBL sustainably, focusing on other multiple intelligence contexts.

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