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Building independent character throught project-based learning (PJBL) in grade VIII junior high school students

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Abstract

Background: Student independence has increasingly become a core objective in contemporary education, yet its development is strongly shaped by the instructional strategies employed by teachers. Although innovative learning models such as Project-Based Learning (PJBL) offer strong potential to empower learners, their success largely depends on the extent to which teachers prepare, facilitate, and sustain the learning process. Without systematic planning and thoughtful implementation, even the most promising learning model may fall short of producing meaningful character development.
Aim: This study seeks to describe the implementation process of PJBL and analyze how the model contributes to fostering independent character among Grade VIII junior high school students.
Method: A descriptive qualitative research design was applied. Data were obtained through classroom observations, semi-structured interviews with teachers and students, and documentation of project activities, including learning artifacts, student reflections, and project outputs. All data were analyzed using an inductive approach to identify patterns related to student independence.
Results: The findings indicate that continuous engagement in PJBL activities strengthens several aspects of student independence. Students demonstrate increased initiative in planning tasks, greater responsibility in meeting project deadlines, improved capacity to make decisions, and stronger problem-solving abilities. They also exhibit enhanced time-management skills and active participation during group presentations and collaborative work sessions.
Conclusion: Overall, the study confirms that PJBL is not only beneficial for achieving cognitive learning outcomes but also serves as an effective approach for cultivating deeper independence among junior high school students. The model is therefore relevant and highly recommended for instructional practices that aim to promote autonomy and self-regulated learning.

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INTRODUCTION

Education constitutes a foundational pillar in forming individuals who are intellectually capable, ethically grounded, and socially responsible. It not only fosters cognitive development but also builds awareness, motivation, and self-development necessary for navigating complex life challenges (Dorfman-Furman, 2024; Magolda, 2023; Prisniakova & Aharkov, n.d.). A comprehensive and flexible educational approach is therefore essential to nurture students' intellectual, affective, physical, social, and creative potentials, enabling them to become resilient and future-ready individuals (Boon, 2023). Character formation, however, is a long-term process that requires continuous practice, habituation, and integration within curricular activities, the learning environment, and the exemplary behavior modeled by teachers (Hanafiah et al., 2024; Hidayat & Hidayat, 2024; Lapsley & Woodbury, 2016). The overall progress of a nation is closely linked to the quality of its education system.

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Character habituation within education contributes significantly to strengthening students' mental and moral capacities, shaping essential values such as honesty, discipline, responsibility, and religious character. Teachers therefore hold a pivotal role, as they are expected to model positive behaviors and guide students not only through instruction but also through example, as reflected in cultural pedagogical principles such as those emphasized in Javanese educational philosophy. In the context of 21st-century learning, students must develop a range of competencies, including critical thinking, creativity, collaboration, and communication, to meet global demands (Dilekçi & Karatay, 2023; González-Salamanca et al., 2020; Thornhill-Miller et al., 2023). This aligns with Indonesia's national curriculum, where character education is positioned as a major pillar aimed at developing morally responsible, independent, and skilled learners ("Harmony in Education," 2024; Zainuri et al., 2025). Independence, in particular, is highlighted as one of the core values in the Pancasila Student Profile. These values reflect a student's ability to regulate their learning, take initiative, act responsibly, and refrain from excessive dependence on others.

The Indonesian education system, under Law No. 20 of 2003, reinforces this direction by encouraging an independent curriculum that emphasizes meaningful learning experiences, reduced pressure on academic achievement, and strengthened character. Because of this mandate, teachers are expected to employ learning models that facilitate deeper engagement, effective communication of educational goals, and meaningful interactions with students (Amerstorfer & Freiin von Münster-Kistner, 2021; Carroll et al., 2021; Harbour et al., 2015). Poorly coordinated interactions often inhibit learning outcomes and hinder students from developing essential competencies (Kwame & Petrucka, 2021; Le et al., 2018; Wang & Hofkens, 2020). At the junior high school level, many students still experience difficulties in developing independence, often showing dependence on teacher guidance, limited initiative, and low active involvement in learning activities (Delos Reyes & Torio, 2021; Fadlillah, 2020). These difficulties are widespread across diverse school contexts. Students at this developmental stage are particularly vulnerable to passivity when instructional models remain teacher-centered.

Field observations reveal that conventional teacher-centered approaches remain widely used in junior high schools, limiting opportunities for students to think critically, make decisions, and take responsibility for their learning. Such approaches often lead students to rely heavily on instructions rather than initiating actions independently (Dignath & Veenman, 2021). Research shows that conventional instructional methods tend to suppress participation, initiative, and two-way interaction between teachers and students (Mardiana, 2024; Serafini et al., 2022; Yang & Hsu, 2020). Furthermore, learning models that do not position students as active participants in constructing knowledge may hinder the development of independent character (Lombardi & Shipley, 2021; Marougkas et al., 2023; Rasul et al., 2023). These issues underscore the importance of adopting learning models that are student-centered and emphasize autonomy, authentic engagement, and collaborative problem-solving.

Project-Based Learning (PJBL) is recognized as one such model capable of addressing these challenges. PJBL provides meaningful, context-based learning experiences through real-world tasks that require students to plan, execute, and evaluate projects collaboratively (Safiah et al., 2025; Suyono et al., 2025). Through this model, students develop essential skills such as time management, problem-solving, creativity, and decision-making. They also learn to connect concepts to real-life situations, increasing motivation and engagement in the learning process (Chans & Portuguez Castro, 2021; Kong, 2021; Mebert et al., 2020; Srisawasdi & Panjaburee, 2019). PJBL encourages students not only to understand theoretical concepts but also to apply them in authentic contexts, fostering confidence, responsibility, and independent thinking. Previous studies highlight PJBL's effectiveness in improving communication skills, collaboration, and understanding of subject matter while encouraging students to take ownership of their learning.

Despite the substantial evidence supporting the strengths of PJBL, its use in classrooms remains limited, largely due to the extensive preparation required. Moreover, existing research on PJBL has predominantly focused on academic outcomes, problem-solving abilities, or STEM-related contexts. Studies that specifically examine the role of PJBL in shaping independent character particularly among junior high school students remain scarce. Most existing studies are centered on high school or higher education settings, leaving a gap in understanding how PJBL fosters independence at earlier stages of adolescence. Therefore, this study aims to analyze the implementation of the Project-Based Learning (PJBL) model and examine its contribution to the development of independent character among junior high school students.

METHOD

Research Design

This study employed a descriptive qualitative research design to explore how the Project-Based Learning (PJBL) model contributes to the development of independent character among Grade VIII students. Such a design enables researchers to examine natural learning processes, student behavior, and real-time classroom interactions within authentic learning environments. The research was conducted at SMP Muhammadiyah 1 Ngawi, a school that actively applies project-based learning strategies.

Research Participants

Participants were selected using purposive sampling, involving one teacher with consistent experience implementing PJBL and several Grade VIII students who participated in project-based activities. This sampling strategy ensured that the data were directly aligned with the purpose of the study.

Data Collection Techniques

Three methods of data collection were used: observation, semi-structured interviews, and documentation.

1. Observation

Classroom observations were conducted to examine how PJBL was implemented and how independent character indicators emerged during learning. Indicators observed included initiative, task management, problem-solving ability, teamwork, and responsibility. To guide the observation systematically, an Observation Indicator Table 1 was developed. The table helped ensure consistency in identifying visible and non-visible behaviors associated with student independence.

Table 1. Observation Indicators

No.	Aspects	Indicators	Activity (T/ID)
1	Initiative in Learning	Students show enthusiasm to begin the project.	T / ID
2	Task Management	Students plan and manage their assignments independently.	T / ID
3	Problem-Solving Capabilities	Students attempt to find solutions to problems encountered in the project.	T / ID
4	Teamwork	Students actively contribute in group work.	T / ID
5	Reflection and Responsibility	Students reflect on the project process and outcomes.	

2. Semi-Structured Interviews

In-depth interviews were conducted to obtain deeper insights into teachers' and students' experiences during PJBL implementation. Interview questions focused on conceptual understanding, PJBL implementation steps, supporting and inhibiting factors, project evaluation, and observed character development. The Interview Guideline Table was integrated into the method to clearly represent the thematic categories explored during the interviews.

Table 2. Teacher Interview Guidelines

No.	Aspects Explored	Indicators/Guiding Questions
1	Understanding PJBL & Independent Character	Teacher's understanding of PJBL; definition of independence; relationship between PJBL and character development
2	Implementation of PJBL	Steps in PJBL; strategies used; teacher roles in facilitation
3	Supporting Factors	Teacher readiness; availability of facilities; support from school leadership
4	Inhibiting Factors	Limited time, facilities, student readiness; resistance to change; classroom management challenges
5	Results of PJBL	Changes in student independence, teamwork, and problem-solving
6	Evaluation & Future Development	Teacher evaluation; reflection on successes and obstacles; future improvement plans

3. Documentation Analysis

Documentation included photos of classroom activities, project outputs, lesson plans, and student reflection notes. These artifacts served to triangulate data from observations and interviews, strengthening the validity of findings.

Data Analysis Procedures

Data were analyzed using the Miles and Huberman interactive analysis model, which includes:

1. Data Reduction – coding and categorizing observation notes, interview transcripts, and documents;
2. Data Display – presenting condensed information in tables, matrices, and narrative summaries;
3. Conclusion Drawing & Verification – identifying emerging patterns and verifying them through triangulation and participant confirmation.

Ensuring Data Trustworthiness

To ensure the credibility and rigor of the findings, several strategies were applied:

1. Method triangulation (observation, interview, documentation),
2. Source triangulation (teacher and students),
3. Member checking to validate interpretations,
4. Peer examination to refine analytical decisions.

These procedures ensured that the study generated rich, trustworthy insights into how PJBL supports the development of student independence.

The overall process of this study followed a systematic research workflow that encompassed the stages of planning, data collection, analysis, interpretation, and reporting. The complete structure of this research procedure is illustrated in Figure 1, which presents the integrated flow of activities carried out throughout the study.

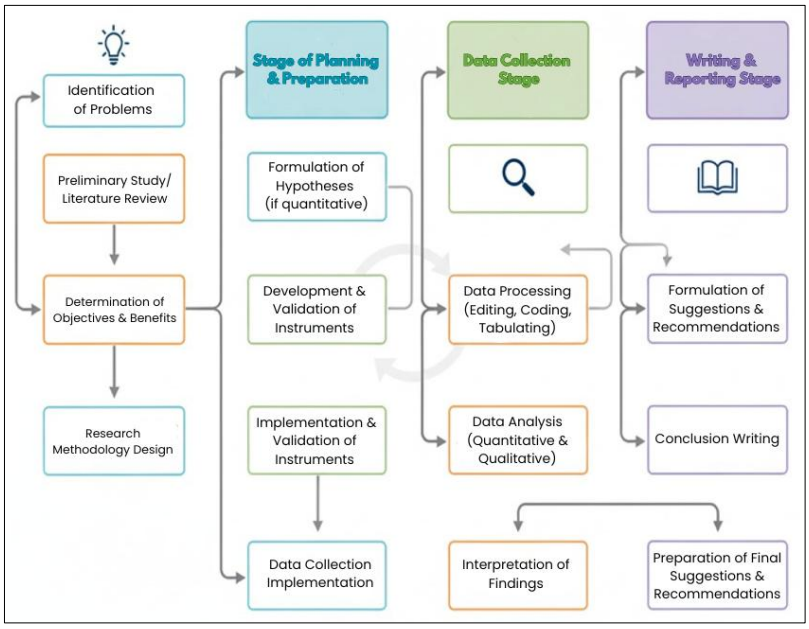

Figure 1. Research Framework

RESULTS AND DISCUSSION

Results

Implementation of the PJBL Model in Classroom Practice

The findings indicate that the Project-Based Learning (PJBL) model was implemented systematically in Grade VIII at SMP Muhammadiyah 1 Ngawi. Teachers followed a structured sequence beginning with the selection of project themes, continued with project planning and execution, and concluded with presentation, monitoring, and evaluation. According to the school principal, this structure ensured that each stage aligned with curriculum goals while positioning the teacher as a facilitator who guided students throughout the learning process. This approach is consistent with emphasizes that project-based learning centers on real-life applications that enable students to design, execute, and present meaningful projects. Teachers reinforced that their competence plays a decisive role in the effectiveness of PJBL implementation. They are required to design project frameworks, organize activities, and evaluate outputs comprehensively. Stated that PJBL is a student-centered model that demands strong teacher facilitation skills to optimize project outcomes. Students reported that PJBL fostered enjoyment, collaborative experiences, and hands-on learning. They expressed enthusiasm particularly when creating project products such as posters, videos, or mockups. Their testimonies demonstrate the motivational dimension of PJBL, that effective learning methods must stimulate creativity, curiosity, and engagement.

Figure 2. Designing a Project

Figure 3. Group Discussions

Figure 4. Project Results

Development of Independent Character through PJBL

The implementation of PJBL contributed significantly to the development of students' independent character. Analysis of observations, interviews, and documentation revealed four key indicators of independence: initiative, responsibility, perseverance, and decision-making skills.

1. Initiative

Students showed increased initiative throughout project activities. They began planning tasks proactively, generating ideas, and initiating steps without explicit teacher prompts. This behavioral shift aligns with the characteristics of PJBL, where students are encouraged to take ownership of their learning by exploring resources and proposing solutions independently. These findings reinforce Budiono et al. (2024), who highlight that PJBL enhances students' ability to take active roles in constructing knowledge.

2. Responsibility

Responsibility was observed through students' growing commitment to completing project tasks, adherence to deadlines, and consistency in fulfilling group roles. Both individual and collaborative responsibilities were strengthened, indicating an internalized understanding of accountability. Students demonstrated self-discipline and awareness that their contributions affected group outcomes. This supports Lavrentieva & Tsys's conceptualization of independence as the capacity to act autonomously while assuming the consequences of one's actions.

3. Perseverance

Perseverance emerged as a prominent trait during project completion. Students persisted in refining their work, overcoming challenges, and conducting trials or revisions. They showed sustained effort in exploring various sources of information and improving project quality. This aligns with the assertion that PJBL promotes resilience and persistence as learners engage in project cycles requiring continuous improvement.

4. Decision-Making

Students also developed stronger decision-making skills. Evidence from group discussions shows that learners compared solution options, assessed risks, and selected strategies collaboratively. They engaged in deliberative thinking supported by relevant data and reflections. Such practices cultivate critical thinking and responsible judgment competencies central to 21st-century learning. Images documenting classroom activities such as project design, group discussions, and project presentations visually reinforced these behavioral developments. These stages reflect the principles outlined in the PjBL model by Global SchoolNet, which emphasizes decision-making, collaboration, and iterative evaluation.

Supporting Factors in PJBL Implementation

Several factors facilitated the success of PJBL at SMP Muhammadiyah 1 Ngawi. Teacher commitment and facilitation were the most prominent. Teachers acted not only as instructional guides but also as motivators who encouraged creativity and collaboration. School support also played an important role by providing resources such as flexible curriculum arrangements, access to laboratories, libraries, and internet facilities—although certain project-specific resources remained limited. The positive learning environment, strengthened by teacher encouragement and administrative support, allowed students to express ideas freely, take responsibility, and collaborate effectively. Assert that supportive conditions enhance the success of PJBL-based instruction.

Challenges in Implementing PJBL

Despite the benefits, several challenges emerged. Teachers reported that student independence varied significantly; some students demonstrated high motivation and initiative, while others remained passive and dependent on teacher directives. This inconsistency affected group performance and required additional teacher intervention. Time constraints also emerged as a major barrier. PJBL requires extensive planning, execution, and evaluation, which often conflicted with the demands of a dense curriculum and limited instructional hours. Teachers expressed concerns that certain projects required more time than was available within standard lesson schedules. Other obstacles included limited facilities for certain types of projects, insufficient parental understanding of PJBL principles, and the readiness level of teachers—some of whom still felt unprepared to apply

the model despite attending training programs. This reflects broader challenges noted in PJBL research, where shifts from conventional methods to project-based approaches often require cultural and pedagogical adjustments. Documentation uploaded on the teacher's YouTube channel further demonstrated varying levels of student participation, indicating differences in independence and motivation across learners.

Discussion

The findings of this study indicate that the Project-Based Learning (PJBL) model provides a learning environment that strongly supports the development of students' independent character. During the project cycle, learners exhibited increased initiative as they planned activities, located relevant information, and constructed ideas with limited teacher intervention (Kundu et al., 2021). This transition reflects a shift from passive participation toward active self-direction in learning. PJBL naturally positions students as the primary agents in knowledge construction, encouraging them to explore issues and make meaningful decisions (Afzal & Tumpa, 2025; Jiang et al., 2022). Such conditions help cultivate autonomy because students learn to regulate their own learning processes. The opportunity to take ownership of tasks further strengthens confidence and fosters the willingness to take academic risks. Collectively, these patterns demonstrate that PJBL contributes substantially to shaping student independence in junior high school contexts.

This study also revealed that PJBL enhances students' sense of responsibility throughout the learning process. Learners consistently fulfilled assigned roles, completed their tasks, and adhered to project timelines, demonstrating an increased level of reliability and accountability (Masood et al., 2020). The structure of PJBL requires teamwork, which makes students aware that their performance influences group outcomes. This awareness encourages them to take their responsibilities seriously and contributes to the formation of responsible learning attitudes. Authentic tasks embedded in PJBL reinforce the idea that responsibility is not limited to academic tasks but includes collaboration and mutual support (Rohmaniyah & Asih, 2024). As students negotiate roles and coordinate actions, they gradually internalize responsibility as part of their identity as learners. These findings affirm that PJBL is an effective pedagogical approach for strengthening responsible behavior in adolescent learners.

Perseverance also emerged as an important dimension developed through PJBL implementation. Students demonstrated persistence by revising their work, responding constructively to challenges, and continuing to exert effort even when faced with difficulty (DiNapoli & Miller, 2022; Hussein, 2021). The iterative nature of PJBL tasks, which involve trial, revision, and refinement, provides a natural context for building resilience (Retno et al., 2025; Sánchez-García & Reyes-de-Cózar, 2025). These learning experiences train students to view obstacles as part of the learning process rather than as reasons to disengage. Such dispositions are crucial for preparing students to tackle complex, open-ended problems in future academic and real-world situations. The sustained effort required in PJBL also strengthens students' confidence in their ability to complete demanding tasks. As a result, PJBL serves not only as instructional methodology but also as a mechanism for nurturing perseverance as a long-term character attribute.

The study further showed that PJBL contributes to the development of students' decision-making skills. Throughout the project, learners discussed alternatives, evaluated potential solutions, and selected approaches that best aligned with project objectives (Feijoo-Garcia et al., 2024; Turanoglu Bekar et al., 2024). This process strengthens analytical reasoning because students must weigh evidence before making a choice. Collaborative decision-making also exposes students to diverse perspectives, encouraging them to synthesize information and negotiate viewpoints. Such

experiences enhance critical thinking and help students become more confident in their judgments. The practice of making decisions within authentic tasks provides a bridge between classroom learning and real-world application. These findings suggest that PJBL is highly effective in fostering thoughtful and strategic decision-making among junior high school learners.

Despite its many benefits, several contextual factors influenced the overall effectiveness of PJBL implementation. Teacher facilitation played a crucial role in guiding students through project stages, sustaining motivation, and providing feedback needed for improvement. School support including access to learning materials, flexible curriculum structures, and digital tools also contributed significantly to implementation quality. However, limited facilities at times restricted the depth and breadth of student project activities. Differences in student readiness and motivation created additional challenges, as not all learners demonstrated equal levels of engagement and independence. Time constraints posed another difficulty because PJBL requires extended phases of planning, execution, and reflection. These conditions highlight that while PJBL is pedagogically powerful, its success depends on coordinated support from teachers, schools, and families, as well as strategic planning to address practical limitations.

Implication

The findings of this study hold several important implications for educational practice, particularly in the context of junior high school instruction. The demonstrated effectiveness of the PJBL model in fostering student independence suggests that schools should strengthen the integration of project-based approaches across various subjects, as this model encourages active participation, deeper comprehension, and sustained engagement. Teachers are encouraged to redesign instructional strategies to include authentic tasks that require students to plan, execute, and evaluate their own learning, thereby promoting autonomy, responsibility, and critical thinking. At an institutional level, schools should provide professional development opportunities to enhance teacher competence in facilitating PJBL, as well as ensure adequate resources, flexible scheduling, and supportive policies that enable project-based learning to be implemented consistently. Collaboration with parents and the community is also essential, since shared understanding and coordinated support can help maximize the benefits of PJBL for students. Overall, this study reinforces the need for a holistic and supportive learning ecosystem that empowers students to become self-directed learners and prepares them to meet the demands of 21st-century education.

Limitations

Although this study provides meaningful insights into the role of the Project-Based Learning (PJBL) model in developing students' independent character, several limitations should be acknowledged. The research was conducted in a single school with a limited number of participants, which restricts the generalizability of the findings to broader educational contexts. The implementation of PJBL also depended heavily on the competence and readiness of the participating teacher, meaning the observed outcomes may differ in classrooms where teachers have varying levels of pedagogical preparation or experience with project-based instruction. In addition, student engagement and independence varied considerably, influenced by differences in motivation, prior habits of self-directed learning, and familiarity with collaborative tasks, which may have affected the consistency of project outcomes. Time constraints posed another challenge, as PJBL requires extended planning, exploration, and revision that often exceeded the formal instructional schedule. Resource availability also varied, with certain projects limited by school facilities and access to materials, thereby influencing the depth and quality of student work. Finally, the level of parental understanding and support was not uniform, which may have influenced students' ability to complete project components outside the classroom. These limitations highlight the need for broader, multi-site research and more structured support systems to strengthen the sustainability of PJBL implementation in diverse school settings.

Suggestions

Based on the findings and limitations identified, future implementation of Project-Based Learning (PJBL) can be strengthened through several strategic recommendations. Teachers should receive ongoing professional development to enhance their ability to design and facilitate project-based activities effectively, ensuring that learning goals, task complexity, and assessment criteria are well aligned. Schools are encouraged to allocate sufficient time and flexible scheduling to accommodate the multi-stage nature of PJBL, enabling students to engage deeply with project tasks without being constrained by limited instructional hours. Increasing collaboration with parents may also improve students' readiness and motivation, particularly by helping families better understand the purpose and benefits of PJBL. Additionally, schools should consider investing in adequate learning resources such as materials, digital tools, and project facilities to support diverse project needs. Future research may involve larger samples and multiple school contexts to develop a more comprehensive understanding of PJBL's impact on student independence. Strengthening these aspects will enhance the sustainability and effectiveness of PJBL in fostering student autonomy and character development.

CONCLUSION

Based on the results of the analysis, it can be concluded that the implementation of the Project-Based Learning (PJBL) model in Grade VIII at SMP Muhammadiyah 1 Ngawi significantly contributes to the development of students' independent character. PJBL provides a learning environment that positions students as active agents in their own learning, allowing them to participate directly in designing, managing, and executing projects both individually and collaboratively. This process cultivates key aspects of independence—such as responsibility, decision-making, discipline, confidence, and time management—through authentic tasks that require students to engage in planning, solving problems, organizing group work, and presenting project outcomes. The structured implementation stages employed by teachers, including topic selection, project planning, task delegation, monitoring, evaluation, and reflection, further reinforce students' autonomy by shifting the teacher's role from the central provider of information to a facilitator who guides and supports learning. Observations and student responses indicate that PJBL not only enhances independence but also increases enthusiasm, active participation, and collaborative engagement in the classroom. Overall, the findings affirm that PJBL is an effective instructional approach for fostering student independence and preparing learners with essential character competencies needed to face academic challenges and real-world demands.

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AUTHOR CONTRIBUTIONS STATEMENT

This research was collaboratively carried out by two authors. Anik Wahyuni led the conceptualization of the study, including the formulation of the research design and methodological framework. She coordinated data collection activities at SMP Muhammadiyah 1 Ngawi, supervised the organization of field data, and conducted the initial stages of analysis. Arina Ristian contributed substantially to the analytical process, including data coding, thematic refinement, and validation of emerging findings. She also played a central role in the interpretation of results and the integration of theoretical perspectives to strengthen the study's scholarly rigor. Both authors jointly drafted, reviewed, and revised the manuscript, approved the final version, and agreed to take full responsibility for the integrity and accuracy of the research.

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