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Constructivism Epistemology and the Application of Project-Based Learning in the Independent Curriculum for English Language Learning

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Abstract
The constructivist epistemology approach offers a strong foundation for developing more student-centred English learning in implementing the Merdeka Curriculum. This study examines the application of project-based learning (PjBL) in the context of the Merdeka Curriculum, where students are empowered to construct their knowledge through projects that link learning content to real situations. Qualitative methods were used in this study involving teachers and students at the secondary school level. Data was collected through classroom observations, in-depth interviews, and analysis of student projects. The study results indicate that applying constructivist epistemology through PjBL can increase student engagement, critical thinking, and collaboration but face challenges in learning evaluation. This study contributes to the understanding of the application of PjBL in the context of constructivism and the Merdeka Curriculum. It provides practical recommendations for the development of more relevant English learning.

Keywords: Constructivism, Epistemology, Project Based Learning, Independent Curriculum, English Language Learning

Introduction

The transformation of education in Indonesia has found momentum through the implementation the Merdeka Curriculum, which offers a more flexible and student-centred learning approach. This curriculum targets developing 21st-century skills such as critical thinking, collaboration, creativity, and problem-solving, which are important in today's global education (Kemdikbud, 2021). As a philosophical basis, constructivist epistemology supports the principle that students are active builders of knowledge who form understanding through dynamic interactions with their environment. This principle is particularly relevant to developing English language skills, especially through learning methods that enable students' active involvement in meaningful activities (Siregar & Fitriani, 2023).

The constructivist approach provides a foundation for experiential learning, where students actively construct meaning. In language learning, especially English, this approach allows students to learn the language mechanically and develop critical and reflective thinking skills through using language in real situations (Purnomo, 2022). However, English teaching in Indonesia is often still teacher-oriented, so that the application of constructivism in its optimal form is still limited in the field (Wibowo & Nugroho, 2022). This challenge emphasizes the need for innovation in learning strategies that not only support the active role of students but are also relevant to the principles of the Merdeka Curriculum.

Project-based learning (PjBL) is one method that aligns with constructivism, which allows students to engage in problem-oriented or product-oriented projects. In English language learning, PjBL supports

students in applying their language to real-life contexts, thereby building more authentic communication skills (Hadi & Mustika, 2021). Research by Arifin and Hartati (2020) shows that PjBL positively impacts the development of critical and collaborative thinking skills, the main competencies expected from implementing the Merdeka Curriculum. Other studies also support that PjBL allows students to explore language more relevant and contextually (Rahmawati, 2023).

However, although the benefits of PjBL are quite prominent, its implementation in the field faces significant challenges, especially in learning evaluation. Conventional evaluations are less able to capture the development of 21st-century skills, especially in the context of PjBL, which requires flexible and holistic assessment instruments (Rizal, 2023). Research by Dewi and Rachman (2022) shows that to capture the impact of PjBL, an evaluation approach is needed that focuses more on the process and the final results to be more in line with the 21st-century skills developed by students. This challenge requires the development of evaluation methods that fully support the implementation of PjBL in a constructivist context.

Furthermore, studies that specifically examine the effectiveness of PjBL in the context of English language learning under the Merdeka Curriculum are still relatively few. While several studies highlight the benefits of PjBL in various fields of study, specific studies in English language teaching under the constructivist paradigm and the Merdeka Curriculum still require in-depth exploration (Setiawan, 2023; Lubis & Anggraini, 2022). This indicates a gap that needs to be filled, especially in understanding the impact of PjBL in a context highly relevant to current educational needs.

This study aims to close the gap by exploring how constructivist epistemology can be integrated through PjBL in English language learning under the Merdeka Curriculum. This study uses a qualitative approach involving classroom observation, in-depth interviews, and student project analysis to understand PjBL implementation and its impact on student engagement and skill development.

Overall, this study is expected to provide new insights for educators regarding implementing PjBL in the context of the Merdeka Curriculum and offer practical solutions related to the evaluation challenges that arise in its implementation. This study is also expected to add to the literature on English language education that is more relevant and focuses on the needs of students in the modern era, following the principles of the Merdeka Curriculum, which supports more adaptive, interactive, and student-centred learning.

Research methods

This study uses a qualitative design with a case study approach to examine the application of constructivism epistemology through Project-Based Learning (PjBL) in the context of the Merdeka Curriculum in English language learning. This study was conducted at SMPN 1 Kota Solok with participants of three English teachers and 8th-grade students. The selection of participants used a purposive sampling technique, targeting teachers and students with direct experience in implementing PjBL in English classes. Data was collected through classroom observations, in-depth interviews, and student project analysis.

Classroom observations were conducted several times to gain an in-depth understanding of the project-based learning process. The observation guide covered collaboration, critical thinking, and the project's relevance to students' lives. In addition, in-depth interviews were conducted with teachers to explore their experiences, challenges, and strategies in implementing PjBL and with students to understand their experiences and engagement in the learning process. The projects produced by students were analyzed based on a rubric that assessed critical thinking skills, creativity, and the application of English in the project context.

The data were analyzed thematically to identify key themes related to the implementation of constructivism and challenges faced in PjBL. The validity of the data was enhanced through source triangulation, by comparing findings from observations, interviews, and student project analysis, and through member-checking to ensure the accuracy of the results. This technique provided more profound insights into implementing PjBL under the Merdeka Curriculum in the context of English learning at SMPN 1 Kota Solok.

Results and Discussion

Research result

1. Student Engagement in Project Based Learning

Classroom observations showed that students were more engaged in learning when given projects relevant to their daily lives. For example, a project that required students to make an English presentation about environmental issues around the school successfully encouraged them to do small research, discuss, and collaborate. Students appeared enthusiastic when collecting data and designing presentation content. The results of class observations show how student engagement develops from session to session. Each session records the level of student collaboration, their critical thinking skills in completing the project, and their interest or involvement. This data from three observation sessions conducted periodically, as shown in table 1.

Table 1. Description of Student Involvement

Observation Session	Engagement Indicators	Description of Student Involvement
Session 1	Collaboration	Some students are active in groups but still passive and must be directed.
	Critical thinking	Students need a lot of teacher guidance to solve their project problems.
	Project Involvement	Students seemed interested as the teacher explained the project in a familiar local context.
Session 2	Collaboration	Some students began to take a more active role in the group; discussions became more frequent.
	Critical thinking	Several students took the initiative to find solutions to problems independently.
	Project Involvement	Student interest remains high, especially in studying topics related to local culture.
Session 3	Collaboration	Almost all students are active; roles are starting to distribute well within the group.
	Critical thinking	Students are more independent in critical thinking without too much intervention from teachers.
	Project Involvement	Students appear more engaged and excited about their projects.

This table illustrates the increase in student engagement in collaboration, critical thinking, and project involvement over time. This observation is consistent with the results of the interviews, where teachers stated that student engagement increased when the project topic was directly related to the reality of their lives. Students also acknowledged in the interviews that they felt more motivated and understood the material better when they could see a direct connection between the lesson and the real world.

Analysis of the projects produced by students showed an improvement in the quality of their work, which reflect a deeper understanding of English. Through this project, students demonstrated critical and analytical thinking skills, especially when integrating factual data into their presentations. Based on the assessment rubric, aspects of project engagement, such as active discussion and initiative in seeking additional information, received high scores. The following figure shows the percentage of student engagement based on the assessment rubric that includes aspects of collaboration, initiative, and relevance of project content

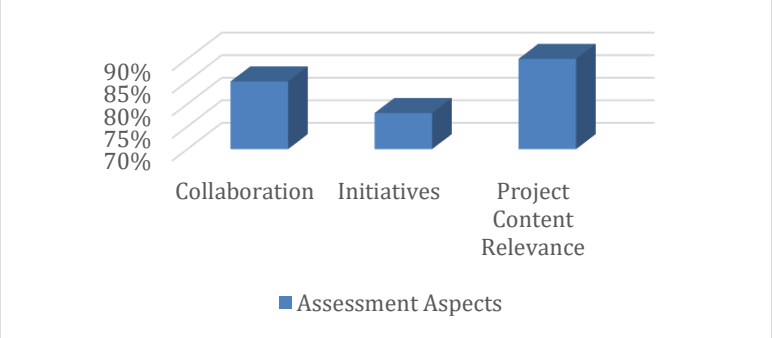

Figure 1. Student Engagement Indicators

2. Improving Critical Thinking Skills through PjBL

During the observation, students showed stronger critical thinking skills during the PjBL process. They often asked deep and vital questions, such as questioning sources of information or analyzing the impact of environmental issues in their projects. Teachers noted that this resulted from using a constructivist approach, which encourages students to construct their understanding rather than simply receiving information from the teacher. In interviews, teachers explained that PjBL was more helpful in developing students' critical thinking skills than traditional teaching methods. Students also found this beneficial, as they mentioned that the projects challenged them to think further than usual.

Analysis of student projects shows that many of them can present logical arguments supported by evidence, which indicates the development of critical thinking. For example, a project that asked students to solve environmental problems showed that they could identify problems and offer reasonable recommendations. This is reflected in the increase in scores on the critical thinking aspect of the assessment rubric student projects, where aspects such as identifying problems and proposing solutions obtained high average scores. The following diagram shows the average scores on the critical thinking aspect in the assessment rubric.

3. Student Collaboration and Interaction in the Learning Process

PjBL encourages students to work together in groups, which creates a collaborative environment during the learning process. Observations show that students often discuss, share ideas, and divide tasks into groups. Teachers see positive changes in how students communicate and work together compared to before the implementation of PjBL. Interviews with teachers confirmed that group work allows students to learn from each other and strengthen their English comprehension through interaction. Students also admit that collaboration helps them understand the material better and enrich their ideas through the perspectives of other group members.

The project analysis also showed solid collaboration results, with the final project's quality showing each group member's contributions. In addition, the resulting project showed that students could combine different ideas and express them in more fluent and structured English. In the collaboration assessment rubric, students scored high on sharing tasks and working together to achieve project goals. The following figure illustrates the average scores on collaboration, interaction, and task sharing in student projects.

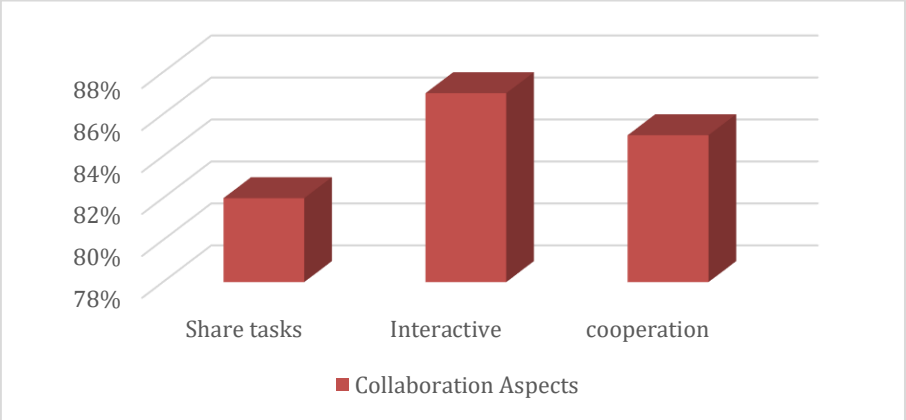

Figure 2. Collaboration Assessment Aspects

4. Challenges in Project-Based Learning Evaluation

Although PjBL brings many benefits, some challenges arise in terms of evaluation. Observations and teacher interviews revealed that evaluation in PjBL requires more flexible and comprehensive instruments. Teachers often find it difficult to assess complex skills such as collaboration and critical thinking with conventional evaluation methods. Teachers mentioned the need for an assessment rubric to capture the student's learning process, not just the final project results. Students also felt that assessment methods often did not adequately reflect their efforts and involvement in the project.

In-depth interviews were conducted with three English teachers and some of the participating students to gain a deeper perspective on the challenges and benefits of PjBL. The table below summarizes their views on the challenges they face, the benefits they perceive from PjBL, and suggestions for improving its implementation in the classroom.

Respondents	Challenges in PjBL	Benefits of PjBL	Suggestions for Improvement
Teacher 1	Difficulty in evaluating critical thinking skills in depth.	Increased student engagement and creativity.	Developing more holistic evaluation methods.
Teacher 2	Differences in student motivation hinder cooperation within groups.	Improve communication and collaboration skills.	Helping students be more active and confident in groups.
Teacher 3	Need more time to support group projects.	Students better understand the relevance of English.	Added resources and project examples.
Student A	It is difficult to work together because of differences in ideas in the group.	Understanding the context of English usage.	More direction from the teacher in selecting project topics.

Data from the project analysis revealed a gap between the process and the outcomes assessed. Many students demonstrated active and collaborative work processes, but these aspects were often not reflected in the final project assessment. This challenge highlights the importance of developing appropriate assessment methods to measure 21st-century skills in a constructivist context.

Discussion

The application of constructivism epistemology through Project-Based Learning (PjBL) in English learning at SMPN 1 Kota Solok shows an increase in student engagement, critical thinking skills, and collaboration, in line with the findings of Arifin and Hartati (2020) and Hadi and Mustika (2021). Increasing student engagement in projects relevant to their real lives supports the constructivist principle that learning occurs optimally when students actively build their understanding (Siregar & Fitriani, 2023). With this active involvement, students learn English mechanically and utilize the language in meaningful contexts, reflecting the success of PjBL as a learning method that enables authentic learning experiences (Rahmawati, 2023). This relationship is in accordance with the concept of the Merdeka Curriculum, which supports adaptive learning relevant to students' lives.

The finding that PjBL improves students' critical thinking skills is supported by literature that underlines that project-based learning encourages students to identify problems, construct arguments, and propose solutions (Dewi & Rachman, 2022). This critical thinking process allows students to dig deeper than simply understanding language in a theoretical context, inviting them to question information, evaluate the relevance of content, and integrate new knowledge into a broader understanding. According to research by Setiawan (2023), PjBL correlates with improved critical thinking skills because problem-oriented projects require structured analysis and decision-making. This study shows that students who engage in environmental projects are forced to use their critical thinking skills to analyze issues and find solutions. Thus, this finding strengthens the relevance of constructivist epistemology in shaping more reflective and in-depth English learning.

The increased collaboration skills in PjBL indicate that this method facilitates more meaningful student interactions, allowing them to learn through discussion and teamwork. Wibowo and Nugroho's (2022) research revealed that collaboration is an important aspect of student-centred learning, where students learn from the perspective of their peers and develop social and communication skills. Observations and interviews showed that students involved in PjBL could divide tasks effectively and

work together to achieve the expected results. This supports the findings of Lubis & Anggraini (2022) that collaborative work in PjBL creates a learning environment rich in interaction and strengthens social relationships among students, which is important in language learning that requires communication skills.

However, the challenges faced in evaluating students' skills in PjBL indicate that traditional assessments are not adequate enough to assess 21st-century skills developed in constructivism, such as critical thinking, collaboration, and engagement. This finding is consistent with Rizal's (2023) study, which emphasized that conventional assessments do not cover all dimensions of learning in PjBL, especially those related to collaborative processes and critical thinking skills. Dewi and Rachman (2022) also emphasized the need for a comprehensive and holistic evaluation approach to measure the impact of PjBL. Therefore, evaluation in PjBL requires the development of a more flexible and process-focused rubric, as outlined in the results of this study, which also highlights the importance of assessments involving both process and product aspects in the final assessment of student projects.

Theoretically, this study underlines the validity of constructivism epistemology in developing students' English language skills through project-based learning. This finding strengthens the view that project-based learning rooted in constructivism allows students to interact with learning materials in relevant and meaningful contexts. The application of constructivist epistemology allows students to become active learners who construct their knowledge through direct experience and social interaction (Purnomo, 2022). This study adds to the empirical evidence that PjBL improves learning outcomes and enriches the in-depth learning process when implemented with comprehensive evaluation support.

Practically, this study has important implications for educators focused on developing a curriculum relevant to the Merdeka curriculum. Using PjBL requires thorough preparation, especially in compiling contextual projects and developing assessment instruments that accommodate various aspects of learning. Teachers must be trained to adapt more holistic and flexible evaluation methods to better suit PjBL's characteristics. In addition, developing an evaluation rubric that can assess collaboration skills, critical thinking, and process involvement will help teachers capture student development more accurately and comprehensively.

Conclusion

This study shows that applying constructivism epistemology through Project-Based Learning (PjBL) in English learning in the Merdeka Curriculum significantly increases student engagement, critical thinking, and collaboration skills. This study shows that students involved in projects relevant to their real lives become more motivated to build their understanding through meaningful activities, which aligns with the principle of constructivism that places students as active builders of knowledge. With this approach, students' skills in analyzing information, collaborating in groups, and applying English in real contexts have significantly improved, fulfilling the research objectives to explore the benefits of constructivism and PjBL in the context of the Merdeka Curriculum.

The practical implication of these findings is the importance of adapting more flexible and student-centred learning methods to support the implementation of the Merdeka Curriculum. The development of holistic and process-oriented evaluation rubrics is needed so that assessments of 21st-century skills, such as critical thinking and collaboration, can be more accurate and comprehensive. Thus, teachers can be more effective in supporting the development of student's skills as a whole and creating a learning environment that is responsive to the needs of modern education.

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