Student Character Building through Project Based Learning in the CCU (Cross Cultural Understanding) Course

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Abstract

This research explores how student character is formed through Project-Based Learning (PjBL) through the Cross Cultural Understanding (CCU) course. PJBL offers students the opportunity to address real-life challenges and problems. In addition, PjBL also encourages a more dynamic classroom approach. This research used a qualitative research design. This research shows that the PjBL method is in line with the concept of 21st-century learning, namely in developing student character, including critical thinking, creativity, communicative and collaborative. In general, PjBL provides a different set of skills than those usually obtained in traditional teaching and learning, making it a viable learning model for shaping student character so they can face new lives in the challenges of society 5.0. Studying the effect of project-based learning on student character development within the CCU framework in Indonesia is a significant topic of research. Learning is a complex journey that extends beyond just acquiring academic knowledge, and the growth of students' personality, principles, and cultural understanding is equally significant. This research involved 25 individuals, including students and lecturers, selected through random sampling. Data collection includes interviews, classroom observations, and document analysis. The research results show three main things in cultivating student character: strengthening communication skills, teamwork and understanding related to moral values in CCU. This study provides valuable information for lecturers and policymakers to improve the quality of education. Including PJBL in CCU is a promising approach to prepare students for the complexities of a globalized society like Indonesia and other culturally varied countries.

Keywords: cultural understanding cross (ccu), student character building, project-based learning

1. Introduction

Project-Based Learning (PjBL) is a method that helps promote cooperation, analytical thinking, and practical problem-solving abilities in students (Daineko et al., 2022; Gunarathna et al., 2023; Junaidi et al., 2022; Sapan et al., 2020). PJBL combines learning by working together on projects that provide genuine experiences from the real world (Belwal et al., 2020). It has been demonstrated to provide students with job-related abilities and enhance their interpersonal skills, particularly in communication and self-assurance. The application of PJBL using a

Higher Order Thinking Skills (HOTS) strategy has been demonstrated to boost students' oral communication skills and foster their critical thinking, creativity, problem-solving, and collaborative abilities.

PjBL is an educational approach that focuses on the student's involvement in projects that represent real-life situations, promote a better comprehension of the topic, and develop practical skills that can be used outside of the classroom (Al-Bahadli et al., 2023; Deshpande, 2022; Lavania & Giri, 2023; D. Zhang, 2023). This approach is acknowledged to enhance student involvement and the effectiveness of long-term learning (de Souza Fausto et al., 2022). PJBL offers students chances to tackle real-life challenges and issues, encouraging a dynamic classroom approach. By dedicating time to investigating and resolving difficult questions or engaging concerns, students get a more profound understanding in a subject. The application of PJBL has been demonstrated to enhance students' motivation, involvement, and curiosity in learning. It also improves pupils' ability to learn on their own and raises awareness of the real-life use of the subject matter. In general, PJBL presents an alternative to conventional lecture-based approaches and offers students significant learning opportunities that equip them to handle real-life scenarios.

The incorporation of the Cultural Understanding Cross (CCU) framework into the curriculum in Indonesia seeks to promote cultural understanding and global competency among students, in accordance with national education objectives that extend beyond academic success (Tiawati et al., 2023). The integration of Project-Based Learning (PJBL) and CCU not only has the potential to enhance educational results, but also plays a key role in the development of students' character (Varelasiwi, 2023). Multicultural education has a significant impact on students' understanding, beliefs, and behaviors in a society with varied backgrounds (Thahir, 2023). It promotes schools to foster understanding and acceptance, encouraging the ability to work together despite any differences (Magdalena et al., 2023). The nature of a country is determined by the government's political determination and the country's vision, with Indonesia's national identity being based on three basic principles: nationality, the declared state, and the territory united under the motto "Bhinneka Tunggal Ika" (Kumalasari, 2023). Through the incorporation of cultural information into language instruction, students can cultivate proficient communication abilities and gain a deeper appreciation for different cultures.

Project Based Learning (PjBL) is a modern teaching method that provides students with a hands-on and practical learning experience. It goes beyond the limits of the traditional classroom and offers students practical experiences, diverse viewpoints, and interactive tasks (Fulton et al., 2023). PJBL has been shown to promote skills related to global citizenship, such as understanding different cultures, effective communication, and a feeling of civic duty (Mousena et al., 2022). It encourages the development of critical thinking, introspection, and participation in hands-on learning (Chhatlani, 2023). In addition, PJBL promotes students' understanding of social justice, environmental responsibility, and empathy (Cetin et al., 2023). By incorporating comprehensive learning methods, such project-based learning, into global citizenship education, individuals can develop into accountable and engaged global citizens in an interconnected world (Cetin et al., 2023). This study aims to investigate the influence of project-based learning on the development of student character in the distinct educational setting of Indonesia, particularly by using the Cultural Understanding Cross (CCU) framework as a perspective.

Studying the effect of project-based learning on student character development within the CCU framework in Indonesia is a significant topic of research. Learning is a complex journey that extends beyond just acquiring academic knowledge, and the growth of students' personality, principles, and cultural understanding is equally significant. Modern teaching techniques, such project-based learning (PjBL), can work together with efforts to promote cultural awareness to equip Indonesian young people for a globalized society. The connections between PJBL and the CCU framework are in line with worldwide initiatives to go beyond traditional teaching methods (Saputri et al., 2023; W. Zhang et al., 2023). Gaining knowledge on how PJBL can boost student creativity (Manik, 2023), strengthen reading skills (Monika et al., 2023), promote collaboration (Purnawirawan, 2020), and improve critical thinking and interpersonal abilities offers useful insights for integrating PjBL in the Indonesian education system.

Studying the impact of Project Based Learning (PJBL) on students' character development in a cultural setting is valuable for the discussion on education. The emphasis is not solely on academic achievement, but also on the overall development of students. The importance of this research is highlighted by the immediate requirement to revamp the education system in Indonesia, considering the intricate issues of the 21st century, such as globalization and technological progress. The study emphasizes that traditional educational approaches are no longer sufficient, given the need of developing one's character to prepare for the future. This research intends to address the lack of knowledge of innovative ideas in the Indonesian setting by examining the connection between PJBL, character development, and cultural understanding.

The absence of concrete evidence and thorough studies exploring the subtle ways in which PJBL contributes to overall student character development is an issue in education. Nevertheless, character education is considered a top concern in numerous countries, such as Indonesia (Abas et al., 2023; Saputra & Ningsih, 2023). Educational institutions have a significant impact on forming children's character through character education, which includes cognitive, emotional, and physical dimensions (Tandana et al., 2022). Enhancing character education necessitates collaboration across schools, families, and communities, along with incorporating character

principles within the curriculum (Isroani & Huda, 2022). Teachers have a crucial role in teaching pupils about character, not just by giving them information or knowledge but also by guiding them and setting excellent examples (Kusumawardhany et al., 2023). The comprehensive implementation of educational principles and the equilibrium between thinking, emotional, and physical aspects are crucial in fostering moral development. While additional empirical data is necessary, these studies emphasize the significance of character education in influencing students' character and values.

Without thoroughly comprehending these factors, teachers and decision makers may struggle to maximize the potential advantages of PJBL in Indonesia's distinct socio-cultural setting. This research aims to investigate the effects of project-based learning on students' character development within the CCU framework in Indonesia. The research will address the following questions: (1) How does project-based learning (PJBL) affect the development of students' character in the context of CCU in Indonesia? (2) What are the particular components of PJBL in CCU that help to the development of students' character? (3) What is the perception of teachers regarding the usefulness of PJBL in fostering students' character development in the Indonesian school system?

1.1 Project-Based Learning (PjBL)

Project-Based Learning (PjBL) is an educational approach that focuses on students and encourages them to think critically, develop problem-solving abilities, and gain a deeper comprehension of the subject matter. It involves students in long-term, cooperative projects that tackle real-life issues. PJBL has been demonstrated to improve academic performance and cultivate crucial abilities for success in the modern era, such as communication, collaboration, and flexibility (Daineko et al., 2022; Dan & Xueyan, 2023; Deshpande, 2022; Doyan et al., 2023; Imbaquingo & Cárdenas, 2023). The method includes students autonomously investigating and resolving issues, creating educational videos, carrying out hands-on research, and taking part in project contests. PJBL not only develops students' current skills but also boosts their enthusiasm, interest, and involvement in learning. It offers a dynamic and creative method for teaching, encouraging student involvement and enhancing reading and understanding abilities in English language learning situations. PJBL is successful in fostering conventional technical abilities, essential interpersonal skills, and fluency in visual-image engineering language. In general, PJBL is an educational strategy that brings about significant changes and prepares students for addressing difficult problems in real-life situations. It also provides them with the necessary skills for success in the contemporary world. The engaging quality of PJBL experiences makes it a viable approach for fostering the overall growth of pupils, going beyond cognitive results to encompass social-emotional and personal aspects.

1.2 Student Character Building

Character development in students entails purposeful cultivation of values, attitudes, and actions that contribute to their general well-being and success in life. It is a long-term journey impacted by educational experiences (Chairiyah, 2017). Nurturing values like honesty, accountability, and compassion is essential for establishing a moral and ethical base (Aryadiningrat et al., 2023). Character education helps students develop the skills they need to understand and engage with the diverse world around them. It is connected to other areas of education, such as teaching methods, school environment, and the inclusion of ethical and moral values in the curriculum (Zuliani et al., 2023). Comprehending the processes involved in shaping one's character is crucial for educators who aim to develop persons who are not only knowledgeable, but also morally and ethically responsible members of society.

1.3 Cultural Understanding Cross (CCU) in Indonesia

CCU is a distinctive program in Indonesia that combines cultural aspects with other topics to promote cultural awareness and global proficiency (Tiawati et al., 2023). This approach is in line with national education objectives, which prioritize the development of character in addition to academic success (Thahir, 2023). In a nation with various races, languages, and customs, CCU aims to help students manage the intricacies of Indonesia's multicultural society (Izzati et al., 2023). Through the integration of cultural viewpoints into the curriculum, CCU strives to cultivate students who value and comprehend the diverse aspects of Indonesian society (Suardana et al., 2023). This method acknowledges the significance of cultural knowledge in fostering excellent communication abilities and cross-cultural comprehension (Syakur et al., 2023). It also emphasizes the need of intercultural education in training pupils to appreciate and accept diverse perspectives. In general, CCU offers a structure for incorporating cultural comprehension into education, which helps in the growth of individuals with diverse knowledge in Indonesia. The framework's focus on developing characters within a cultural context makes it an interesting setting to examine the potential connections with PJBL in improving student learning results.

1.4 PJBL and Character Development: Existing Research

PJBL has a favorable effect on students' ability to work together and communicate, which are crucial parts of developing their character (Zuliani et al., 2023). Nevertheless, additional investigation is required

regarding the social and emotional aspects as well as the ethical aspects of character development in the context of PJBL, particularly when integrated with frameworks for cultural understanding. This research gap emphasizes the necessity for a more profound comprehension of how PJBL specifically contributes to character development (Khalid et al., 2023). Within the wider educational framework, character education programs are most successful when included into the curriculum rather than presented as separate efforts (Giwangsa et al., 2022). This is in line with the reasoning behind CCU in Indonesia, where character development is integrated into several courses (Hakim & Dewi, 2022). Nevertheless, the precise influence of PJBL inside this cultural environment has yet to be investigated. Comprehending the relationship between PJBL, CCU, and student character development is important for educators and policymakers who want to create educational experiences that fully prepare students for the challenges of the 21st century.

1.5 Theoretical Framework: Social Constructivism

This study uses a social constructivist perspective to examine how students develop their character in the setting of PJBL and CCU. Social constructivism asserts that knowledge and understanding are created via collaborative engagement and shared experience (Mishra, 2023; Naidoo & Mabaso, 2023). This viewpoint is evident in the implementation of problem-based learning (PJBL), where students actively participate in cooperative projects to build knowledge (Leiberman, 2022). The inclusion of a cultural viewpoint, as highlighted in CCU , acknowledges the impact of cultural and social aspects in shaping student character (Shakeela, 2020). The social constructivist method emphasizes student independence, thoughtful analysis, finding solutions, working together, providing support, and conversation as important elements in education (Vaiciuniene & Kazlauskiene, 2022). This method also highlights the importance of the instructor as a facilitator and guide in the process of learning. Social constructivist learning theory blends the building of knowledge by learners with collaborative efforts within a sociocultural context, which makes it commonly employed in health professions education. The social constructivism method acknowledges the shared, conversational, and interactive nature of experience in teaching and learning, highlighting the importance of social interaction, the collaborative formation of social reality, and the function of communication in constructing knowledge. The social constructivist viewpoint offers a theoretical framework to examine how collaborative learning experiences in PJBL, enhanced with cultural awareness, contribute to the development of students' character in the Indonesian educational setting.

1.6 Gaps in the Literature

Although there is an increasing acknowledgment of the beneficial effects of PJBL on student outcomes and character development, there is a lack of research that particularly investigates these dynamics within the cultural context of Indonesia and the CCU framework. Previous research frequently concentrates on either PJBL or character development separately, disregarding the possible benefits when these two educational techniques come together. In addition, the existing study in the Indonesian setting does not fully explain the complex connections between PJBL, cultural understanding, and character development.

2. Research Methods

2.1 Research Design

This study investigated the effects of project-based learning (PJBL) on students' character development in Indonesia using the Cultural Understanding Cross (CCU) framework using a qualitative research design. The intricacy of educational phenomena can be effectively captured through qualitative research, which enables a thorough examination of participants' viewpoints and experience (Creswell, 2013). Semi-structured interviews, document analysis, and classroom observation were all part of the research design. Fifteen individuals who represented students, instructors, and administrators from Indonesian schools using the CCU framework participated in this study. To guarantee diversity in terms of school type, location, and socioeconomic background, a purposive sample technique will be employed. The engagement of multiple stakeholders will yield a comprehensive comprehension of PJBL's effects within the framework of CCU .

2.2 Data Collection

Interviews

Five groups of participants participated in semi-structured interviews: policy makers interested in curriculum development; school administrators supervising CCU ; teachers executing PJBL; teachers specializing in character education; and students participating in PJBL at CCU . Within the context of the CCU framework, the interviews

investigated the participants' perspectives, experiences, and ideas regarding the influence of PJBL on students' character development.

Classroom Observation

Observations were made in the framework of CCU during PJBL sessions. These observations gave us a firsthand look at the dynamics of character development in the classroom, the degree of student engagement, and the way PJBL was applied. Use of a structured observation strategy allowed for the systematic recording of pertinent PJBL process elements.

Document Analysis

Relevant records that included student projects, evaluations, and curriculum materials were examined to see how PJBL was incorporated into the CCU framework. Document analysis shed light on how well PJBL matched character development goals and how much cultural sensitivity was included into the teaching resources. The research's rigor and dependability were enhanced by the triangulation of data sources.

Data Analysis

NVIVO, a software application created specifically for qualitative data analysis, was used to analyze qualitative data gathered via interviews, classroom observations, and document analysis. Thematic coding was used in the analysis (Braun & Clarke, 2006). Using the CCU methodology, data were methodically coded to find recurrent themes on how PJBL affects students' character development.

Ethical Considerations

The research process will be conducted with full adherence to ethical requirements. Every participant will be asked for their informed consent, guaranteeing their voluntary involvement and privacy. In the reporting of findings, participant identities will be protected by the use of pseudonyms. The research will also follow ethical guidelines for the collection, use, and distribution of data.
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3. Results and Discussion

Within the framework of the Cultural Understanding Cross (CCU) in Indonesia, the impact of project-based learning (PJBL) on students' character formation has been nuancedly revealed through the qualitative analysis of data collected from interviews, classroom observations, and document analysis using NVIVO. In order to give readers a thorough grasp of the research topics, the results are presented using thematic patterns that arose from the data.

3.1 Theme 1: Communication Skills

Within the Cultural Understanding Cross (CCU) framework, project-based learning (PJBL) fosters improved teamwork and communication abilities. This was the first theme to emerge from the data analysis.

Teachers were always pointing out how PJBL changed the dynamics in the classroom. It was believed that putting a strong emphasis on a collaborative learning environment would encourage student involvement and engagement. *"PJBL adds a new dimension to our classroom,"* said Teacher A. *Pupils are collaborating, exchanging ideas, and learning from one another in an active way. It's about the group's overall success rather than just individual success."*

Students emphasized the transition from traditional teacher-centered classrooms to participatory, peer-driven ones, echoing this view. They conveyed a feeling of empowerment and personal responsibility for their education. Student C said, *"The teacher spoke much of the time prior to PJBL. We are all participating in the discussion now. Being able to participate and knowing that my opinions are valued makes me happy."*

Using cooperative PJBL projects to overcome language obstacles was another significant subtheme that surfaced. Students in culturally diverse classrooms overcame linguistic barriers to find common ground and develop their communication abilities. The difficulties of collaborating with peers who speak various languages are acknowledged by the pupils. They did, however, highlight the advantages of overcoming language barriers in cooperative PJBL encounters. *"We have students from different regions who speak different languages in our project group,"* said student D. *PJBL helped us realize that we can communicate through actions and shared objectives in addition to words."*

PJBL's collaborative and interactive character is in line with the enhanced communication and teamwork abilities mentioned in this subject. These results are consistent with the CCU principles, which highlight the value of effective communication and cultural awareness in different learning situations. The transition from traditional

teaching approaches to collaborative learning environments highlights the potential of project-based learning (PJBL) to establish student-centered classrooms. This change is essential for developing in kids not only communication skills but also a sense of group responsibility and reciprocal learning. Furthermore, given that linguistic variety is a defining characteristic of Indonesia, PJBL's capacity to overcome language barriers is especially pertinent there. These results imply that PJBL offers a setting where students can grow in both language competency and cross-cultural and cross-linguistic communication skills.

3.2 Theme 2: Team work in Project-based Learning

During the data analysis, a second theme surfaced that focused on the intentional incorporation of cultural components into project-based learning (PJBL) activities. Within the context of the Cultural Understanding Cross (CCU) framework, this theme emphasizes how crucial cultural sensitivity is to project design.

Instructors have always emphasized how important it is to intentionally incorporate cultural components into PJBL project designs. The goal is to promote cultural sensitivity and relevance by integrating academic content with cultural surroundings. Teacher C says, *"We intentionally incorporate cultural components into PJBL project design. Learning a subject is not as important as comprehending how it relates to our culture, customs, and values."*

The integration of cultural material into their PJBL projects was acknowledged by the students. They conveyed gratitude for the chance to investigate the topic in a culturally appropriate setting, expanding their comprehension of academic material and cultural legacy. Student E stated, *"We had to take into account traditional farming practices for our project, which was on local agriculture. As a result, the project was more engaging, and we gained knowledge about both our cultural and agricultural heritage."*

The growing cultural awareness of PJBL students at CCU was a significant subtheme that surfaced. Students had the chance to investigate, value, and celebrate cultural diversity in their classrooms and communities because to PJBL's participatory and hands-on approach. Teachers saw that students' knowledge of cultural differences had improved. PJBL initiatives promote a culture of diversity by encouraging students to investigate and share all facets of culture. Teacher D stated, *"Students learn about each other's cultures as well as the topic matter through PJBL. A richer and more inclusive learning environment is produced as a result."*

The idea of greater cultural knowledge was repeated by the students. They emphasized how the PJBL project enabled them to learn more about their cultural background and impart this information to their peers. Student F said, *"We had to investigate the cultural relevance of customary rites as part of our study. Finding out about the various ceremonies in our group was fascinating, and it helped me to value the diversity of our cultures."*

The relevance of cultural integration in PJBL was emphasized in Theme 2, which is consistent with CCU 's mission to promote cultural respect and understanding among students. One of the main tactics used by educators to develop a curriculum that is suited to students' cultural backgrounds is the intentional integration of cultural components in project design. The results imply that PJBL provides a special opportunity for students to investigate academic material from the perspective of cultural diversity. This method helps create a more inclusive learning environment while also enhancing the learning experience's relevance and authenticity. Furthermore, it appears from the students' heightened cultural awareness that PJBL, when combined with CCU , accomplishes more than just imparting subject-matter knowledge. It acts as a spark for cross-cultural communication and comprehension, building the groundwork for pupils to become culturally competent adults.

3.3 Theme 3: Understanding related to moral values in CCU

The third theme that surfaced from the data analysis was the role that project-based learning (PJBL) plays in the development of understanding to moral values in Cultural Understanding Cross (CCU), with a particular emphasis on the development of critical thinking and problem-solving abilities.

Through their participation in PJBL activities, teachers regularly saw a considerable improvement in their students' critical thinking and problem-solving abilities. Because the project is open-ended, students must analyze, synthesize, and suggest solutions, which encourages an inquisitive and exploratory approach. Teacher G emphasized, *"PJBL fosters critical thinking in students. Instead of merely memorization, they use the knowledge to address practical issues. This enhances flexibility and resilience, two critical components of character development."*

The pupils agreed, highlighting how the PJBL method inspired them to think beyond memorization. They said they felt more confident now to take on obstacles in the classroom and in the real world by adopting a problem-solving approach. Student H revealed, *"I used to memorize before PJBL. I now consider the causes and mechanisms of things. Understanding the process is just as important as getting the answers, and it has completely altered the way I approach everything."*

Intentionally including moral and ethical issues into PJBL projects evolved as another significant subtheme. Instructors stated that they support conversations about moral decision-making, societal effect, and ethical conundrums as a crucial component of the educational process.

Instructors emphasized how crucial it is to incorporate moral and ethical debates into PJBL. They emphasized how these kinds of conversations help pupils develop a sense of accountability and a knowledge of ethical issues. Teacher I said, *"We frequently talk about the ethical aspects of the solutions that students submit in our PJBL projects. Finding the best answer that is consistent with our beliefs and ideals is more important than simply coming up with a solution."*

The significance of ethical considerations in their initiatives became apparent to the students. They explained how these conversations enhanced their work and inspired them to consider the larger ethical ramifications of their choices. Student J said, *"We had to consider what is right as well as what works as a result of our project. Normally, we wouldn't think about this in other classes, but PJBL forced us to examine the wider picture and how our answers would affect society and individuals."*

The third theme examined the comprehensive character development made possible by PJBL's incorporation within the CCU framework. Results indicate that PJBL fosters the development of critical life skills and ethical awareness in addition to acquiring academic knowledge. Developing critical thinking and problem-solving abilities is in line with the larger goals of character education. PJBL projects' open-ended approach allows students to investigate, analyze, and assess data, developing an inquisitive mindset and adaptability—qualities crucial for success in both the personal and professional spheres. Furthermore, the intentional inclusion of moral and ethical discussions in PJBL projects shows an understanding of the need to help students improve their ability to make moral decisions in addition to their cognitive skills. This strategy is in line with CCU 's tenets, which include academic knowledge with the instillation of values and beliefs.

3.4. Discussion

The findings demonstrated how project-based learning (PJBL) and the Cultural Understanding Cross (CCU) framework developed by may operate together to support a comprehensive strategy for character development among Indonesian students. Emerging themes highlight how critical thinking skill development, cultural integration, and collaborative learning are all interconnected in educational settings.

The focus on collaborative learning spaces is consistent with CCU and PJBL principles. PJBL fosters collaboration among students by design, which helps them develop their communication and teamwork abilities. The ability of PJBL to get over language barriers is essential in a country as diverse as Indonesia, where pupils come from a variety of language backgrounds. The results demonstrate that interactive PJBL and collaborative learning enhance communication skills and foster a sense of shared responsibility and accomplishment.

It has been demonstrated that combining collaborative learning with the interactive elements of project-based learning (PJBL) enhances communication abilities and promotes a feeling of shared accountability and accomplishment (Dharin et al., 2023; Mustafa, 2022; Sawyer & Obeid, 2017). Studies have demonstrated that collaborative learning and project-based learning (PJBL) are effective ways for helping students develop their soft skills, such as teamwork and communication (Ariani & Valiantien, 2022; Sonte et al., 2022). These strategies have been shown to improve learning results and encourage fruitful discussion among students working in groups. Furthermore, the application of PJBL and Collaborative Learning has been linked to higher academic attainment and better performance in a number of areas, such as grammar and science. According to student reports, collaborative learning activities have enhanced their academic achievement while also enabling them to obtain feedback from their peers and accomplish assignments more successfully. All things considered, these results imply that PJBL in conjunction with collaborative learning can enhance academic accomplishment, shared accountability, and communication abilities.

PJBL projects that intentionally incorporate cultural components show a careful approach to cultural awareness. This result is consistent with the notion that more meaningful educational experiences are produced by inclusive and culturally relevant curricula (Arsad et al., 2020; Arvanitis, 2023; Swagerty, 2022). PJBL gives students the chance to investigate and value both their own and their peers' cultures through the integration of cultural elements into projects. This strategy is in line with the CCU goals, which place a strong emphasis on global competency and cultural awareness.

The findings demonstrated that PJBL significantly aided in the development of whole character when combined with CCU . With an emphasis on delivering inclusive and equitable science education that is relevant to students' backgrounds, needs, and interests, culturally relevant science teaching has drawn more attention in recent years (Arsad et al., 2020). This method is especially crucial in classrooms with a varied student body, since educators must successfully instruct learners from a range of cultural backgrounds (Brown et al., 2022). Given that every community has its own culture and set of ideas, the problem is how to handle the unique cultural background of indigenous people (Pejaner & Mistades, 2020). To support culturally relevant science teaching, professional development programmes have been developed, emphasising cultural exposure, partnerships with community experts, student information gathering, lesson design and critical reflection (Mensah, 2011). Co-planning and teaching experiences can help pre-service teachers apply culturally relevant teaching techniques, which is another crucial function they play (Laughter & Adams, 2012). The importance of academic performance, cultural competency, and sociopolitical awareness in science education is highlighted by a growing corpus of

research on culturally appropriate science teaching. The intentional inclusion of moral and ethical issues in PJBL projects shows a recognition of the need to develop in students not just cognitive skills but also the ability to make moral decisions.

The study's conclusions have a number of ramifications for educational practices both inside and outside of Indonesia. First, teachers can design inclusive and stimulating learning environments by incorporating PJBL's collaborative and culturally rich elements into the CCU framework. Second, PJBL integration is a pedagogical strategy that curriculum designers and policy makers should take into consideration as it supports the objectives of character education, particularly in situations with various cultural backgrounds. In order to ensure the smooth integration of collaborative, culturally-focused, and character-focused learning experiences within the CCU framework, this study highlights the necessity of ongoing professional development for instructors.

Even though the results provide insightful information, it's necessary to acknowledge some limits. The study's context-specific design may restrict how broadly the findings can be applied in other educational contexts. Furthermore, the study's qualitative design might make it impossible to quantify the influence that was seen. In order to provide a more thorough understanding, future study could employ a mixed methods approach to supplement the qualitative findings with quantitative data.

4. Conclusion

This study concludes by describing the significant influence that project-based learning (PJBL) has on Indonesian students' development of character within the scope of the Cultural Understanding Cross (CCU). The themes that have been found underscore the transformative capacity of problem-based learning (PJBL), which prioritises the improvement of teamwork and communication skills, cultural integration, and holistic character development. These results not only support CCU 's goals, but they also add to the growing body of knowledge regarding instructional strategies that help shape morally upright people. These insights can be used by researchers, educators, and legislators to enhance educational procedures and create inclusive, culturally rich, and character-focused learning environments. The inclusion of PJBL in CCU emerges as a promising approach to prepare students for the complexities of a globalized society as Indonesia and other culturally varied countries face the problems of 21st century education.

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