

SOCIAL-SCIENTIFIC COLLABORATION AND LOCAL WISDOM WITH BILINGUAL LEARNING FOR 21ST-CENTURY COMPETENCIES

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Abstract

This study examines the integration of social-scientific collaboration and local wisdom through bilingual learning to develop 21st-century competencies. This qualitative, descriptive phenomenological research was conducted with eighth-grade students at Muhammadiyah 1 Junior High School Kartasura. Data was collected via in-depth interviews, participant observation, and document analysis, validated through source and technique triangulation, as well as member checking. The

results indicate that interdisciplinary integration Social Studies, Natural Sciences, Javanese Language, and English, combined with local wisdom and bilingual learning, significantly enhances students critical thinking, creativity, collaboration, character, and cultural identity. Project-based learning relevant to daily life and local culture fosters greater student engagement, confidence, and active participation. Phenomenological analysis reveals that students experience more meaningful and contextual learning, gaining a deeper understanding of social and cultural values, alongside increased pride and emotional attachment to their local culture. Students are able to connect academic concepts with real-life experiences, enhancing motivation and learning quality.

Keywords: Deep Learning, Collaboration Learning, Project-Based Learning, Bilingual Learning, Social Scientific Collaboration, 21st-Century Competencies.

Introduction

The collaborative of multiple disciplines in education, such as Social Studies, Natural Sciences, Javanese Language, and English Language, is increasingly crucial in addressing the challenges of the 21st century (Darling-Hammond et al., 2017). Modern education requires students not only to master knowledge in isolation but also to connect and apply various fields of study in an interdisciplinary manner (Norman G. Lederman & Sandra K. Abell, 2014). This approach aligns with the vision of the Merdeka Curriculum, which emphasizes inclusive, equitable, and globally minded education, while fostering students' critical thinking, collaboration, and creativity skills (Utia et al., 2024). Interdisciplinary approaches combining social and natural sciences in schools foster critical thinking and problem-solving skills by contextualizing scientific concepts within real-world societal challenges (Högström et al., 2024), though efforts must be made to maintain focus on specific subject matter. The inclusion of local languages like Javanese alongside international languages such as English can enrich students' cultural understanding while enhancing their global communication skills. Interdisciplinary integration, encompassing both social-scientific domains and linguistic diversity, forms a

vital foundation for developing students' competencies relevant to the future (OECD, 2018).

This integrated approach also allows for a more contextualized and meaningful learning experience, enabling students to see the interconnectedness of knowledge and its application in real-world scenarios (Almulla, 2020). One innovative strategy is the integration of project-based learning PjBL with local wisdom content. The implementation of PjBL combined with local values has proven effective in enhancing 21st-century skills such as critical thinking, creativity, as well as values of cooperation and diversity among students. When students engage in PjBL that incorporates indigenous knowledge, they develop not only problem-solving abilities but also a stronger sense of cultural belonging, which is crucial in multicultural societies like Indonesia (Cahyaningsih et al., 2025). Research shows that through projects relevant to students lives and local culture, students not only gain academic knowledge but also develop strong character and cultural identity. This integration also creates a more dynamic and collaborative learning environment, leading to greater student engagement in the learning process. Therefore, this approach is highly relevant for implementation in Indonesian elementary schools.

The integration of local wisdom in learning, especially in Social Studies, significantly contributes to improving students' cognitive abilities and social understanding. Recent studies indicate that using familiar cultural contexts in learning can significantly increase students' cognitive scores, as well as strengthen their engagement and personal development (Syafiq et al., 2023). Learning models that incorporate local cultural values have proven effective in building deeper and more relevant social understanding for students' daily live. This approach not only makes learning more relatable but also fosters a sense of belonging and cultural identity among students. The integration of local wisdom is a key to meaningful and contextual education in today's era of globalization (Banks, 2015). By connecting academic concepts with familiar cultural practices, students can develop a more profound understanding of both the subject matter and their own heritage. Moreover, this integration can promote critical thinking as students

analyze and reflect on their own cultural norms and compare them with broader global perspectives. Ultimately, embedding local wisdom enriches the learning experience and prepares students to navigate the complexities of a diverse world.

Bilingual education that incorporates an ethnopedagogical approach is also a solution to simultaneously strengthen students' cultural identity and language skills. Translanguaging in bilingual education not only enhances language development but also validates students' cultural identities, allowing them to navigate multiple linguistic and cultural worlds seamlessly (García & Wei, 2014). Bilingual education practices that combine local and national or international languages, along with local wisdom content, have proven effective in shaping students' character, identity, and competitiveness. Bilingual programs that incorporate culturally relevant content show higher student engagement and achievement, as they bridge the gap between home and school environments (Wright & Baker, 2017). Research finds that integrating local values in bilingual education can serve as a filter against external cultural influences, while reinforcing traditional values and national character. This approach also increases the effectiveness of learning, from classroom management and student response to overall learning outcomes.

Finally, the integration of cross-disciplinary projects such as Social Studies, Natural Sciences, Javanese Language, and English through bilingual learning based on local wisdom is a strategic step to prepare students for global challenges without losing their cultural roots. This model not only enhances academic and language abilities but also builds character, identity, and 21st-century competencies needed in the digital and globalization era. Successful integration of indigenous knowledge in education requires curriculum flexibility, teacher professional development, and active community participation, yielding sustainable benefits for learners and their communities (Fairus et al., 2024). Integrating local wisdom into 21st-century education enhances rural students' engagement and academic success by bridging cultural identity with the 4Cs (Critical Thinking, Communication, Collaboration, Creativity), though challenges like resource

gaps and teacher training persist (Ibnu Fitrianto & Muhammad Farisi, 2025). With a flexible curriculum, adequate teacher training, and local community involvement, this integration can be implemented effectively and provide long-term benefits for students and society.

Method

This study adopts a qualitative approach with a descriptive phenomenological design. Descriptive phenomenology is a qualitative research approach that seeks to understand the lived experiences of individuals concerning a particular phenomenon. It involves detailed descriptions of how participants perceive and ascribe meaning to their experiences, often through in-depth interviews and thematic analysis (Creswell, 2018). This approach was chosen to explore and deeply describe the lived experiences of participants in the implementation of integrated learning that combines Social Science, Natural Science, Javanese Language, and English Language in eighth-grade classes at Muhammadiyah 1 Junior High School Kartasura. The descriptive phenomenological design enables the researcher to understand how participants perceive and give meaning to their learning experiences, especially within the context of lessons that integrate social issues, environmental understanding, biodiversity, and local traditions. This study specifically focuses on how participants explore these experiences in English Language, using appropriate grammatical structures and verb tenses as taught during the integrated learning process. The research was conducted at Muhammadiyah 1 Junior High School Kartasura. The participants consisted of eighth-grade students and teachers who were directly involved in the integrated learning process. Phenomenological research focuses on exploring the essence of human experiences as they are lived and interpreted by participants. This approach is particularly valuable in educational settings, where understanding teachers' and students' perspectives can reveal deeper insights into teaching and learning processes (Neubauer et al., 2019). They were selected through purposeful sampling, based on their active engagement and relevant experience.

Data Collection Techniques were gathered using the following methods:

1. In-depth interviews: Conducted with both teachers and students to collect detailed reflections and personal experiences related to the integrated learning.
2. Participant observation: Carried out during classroom learning activities to observe interactions, instructional methods, and how local content was embedded in the learning materials.
3. Document analysis: Included student assignments, teacher lesson plans, and other learning artifacts that demonstrated how Social Science, Natural Science, Javanese Language, and English Language were integrated in the classroom context.

Research Instruments

The primary instrument in this study was the researcher, who acted as a human instrument. The researcher was supported by tools such as interview guides, observation checklists, and document analysis protocols. The credibility of the data was enhanced through triangulation of sources and data collection techniques.

The analysis of qualitative data in this study followed a systematic flow, adapted from descriptive phenomenological analysis, consisting of the following stages:

- Data familiarization, where the researcher read and re-read interview transcripts, observation notes, and collected documents to gain an overall understanding of the content and context of participants' experiences.
- Transcription of audio recordings from interviews, which were transcribed verbatim to ensure accuracy and completeness of the participants' expressions.
- Initial coding, in which meaningful units or statements related to the research focus were highlighted and assigned initial codes, capturing key ideas or experiences.
- Theme identification, where the initial codes were grouped into broader categories to identify recurring patterns and themes across different participants' experiences.

- Theme interpretation, where each theme was analyzed in depth to uncover the essential meaning behind the participants' experiences, especially in relation to how they integrated social, environmental, and cultural understanding into learning.
- Language integration analysis, with particular attention paid to how students expressed these themes in English, including the use of appropriate grammatical structures, vocabulary choices, and their ability to communicate interdisciplinary concepts.
- Descriptive narrative construction, where the themes and interpretations were synthesized into a rich descriptive narrative, presenting the lived experiences of participants in a way that reflects both the educational content and the cultural context.
- Validation of the final themes and narratives through member checking, in which participants reviewed and confirmed the accuracy of the findings based on their own experiences.

Findings

A. Main Research Findings

This study yielded several important findings regarding the implementation of integrated learning that combines four subjects at Muhammadiyah 1 Junior High School Kartasura. The descriptive phenomenological analysis of participants' experiences revealed five main themes that emerged from this integrated learning process.

B. Identified Themes

1. Holistic Experience in Multidisciplinary Learning

Participants experienced comprehensive learning where the boundaries between subjects became more fluid. Students reported that they could see connections between social issues and natural phenomena while using Javanese as a medium to understand local traditions and English as a global communication tool. This experience created a deeper understanding of how various disciplines interact in real life.

2. Enhancement of Cross-linguistic Communication Skills

Research results showed that students experienced significant improvement in their ability to communicate using English when discussing concepts, they had understood through integrated learning. They were able to use appropriate grammatical structures and suitable vocabulary choices when explaining social issues, natural phenomena, and local cultural traditions in English.

3. Strengthening of Local Cultural Identity

The integration of Javanese language in learning functioned not only as a communication medium but also as a bridge to strengthen students' local cultural identity. Participants expressed that they felt prouder and understood Javanese traditional values when they could interpret them in a global context through English.

4. Contextual Understanding of Environment and Biodiversity

Integrated learning enabled students to understand environmental issues and biodiversity not only from a scientific perspective but also from social and cultural viewpoints. They could connect knowledge about local ecosystems with traditional practices that Javanese communities have implemented in environmental conservation.

5. Development of Critical and Analytical Thinking Skills

Participants demonstrated improvement in critical thinking abilities when analyzing complex problems requiring multidisciplinary understanding. They were able to connect social theories with natural phenomena while expressing their analyses in English using complex sentence structures and appropriate academic vocabulary.

C. Language Integration Analysis

Specific analysis of English language use in integrated learning revealed several important patterns:

1. Grammatical Structure Usage

Students showed improved ability in using various tense structures when describing studied phenomena. They used present perfect tense to explain long-term impacts of environmental problems, past tense to narrate traditional practices, and future tense to predict sustainable solutions.

2. Vocabulary Selection

There was significant improvement in the use of academic and technical vocabulary in English. Students were able to use scientific terminology to explain natural science concepts, social vocabulary to discuss community issues, and cultural expressions to describe local traditions.

3. Interdisciplinary Communication Ability

Participants developed the ability to communicate complex concepts involving multiple disciplines in English with increased clarity and accuracy.

D. Impact of Integrated Learning

1. On Learning Motivation

Students showed significant improvement in learning motivation because they could see the relevance and practical application of the material studied. Learning was no longer viewed as separate activities but as a unified whole that mutually supported each other.

2. On Conceptual Understanding

There was deepening in students' conceptual understanding of learning material. They not only memorized facts but were able to understand causal and contextual relationships between various phenomena.

3. On Language Skills

Students' language abilities, particularly in English, experienced substantial improvement. They were not only able to use language for daily communication but also for academic discourse and critical thinking.

E. Challenges Faced

1. **Complexity of Learning Planning**

Teachers experienced challenges in designing learning that could effectively integrate four subjects without reducing the substance of each field of study.

2. **Need for Multidisciplinary Competence**

Implementation of integrated learning required teachers with adequate understanding of various disciplines, which was not always available.

3. **Adjustment of Evaluation Methods**

Traditional evaluation systems needed to be adjusted to measure integrative and multidimensional learning achievements.

F. Practical Implications

The results of this study provide several important practical implications:

1. **Curriculum Development:** The need for developing more flexible curricula that support integrative learning.
2. **Teacher Training:** The requirement for comprehensive teacher training programs in integrated learning approaches.
3. **Learning Resource Provision:** Development of learning materials specifically designed to support multidisciplinary integration.

Evaluation System: Design of evaluation systems that can comprehensively measure integrative learning achievements.

Discussion

Research Significance

This study provides significant contributions to the understanding of integrated learning implementation in Indonesian secondary education contexts. The primary significance of this research lies in several aspects:

Theoretical Contributions

The findings of this study reinforce Vygotsky's social constructivism theory, which emphasizes the importance of social and cultural interactions in learning. The integration of Javanese as students' mother tongue with English as a global language demonstrates

how linguistic scaffolding can facilitate deeper conceptual understanding. These results support Cummins' Common Underlying Proficiency (CUP) hypothesis, which states that academic skills in one language can be transferred to another language.

Practical Contributions

Practically, this research demonstrates that integrated learning not only improves students' academic outcomes but also develops holistic thinking abilities. The 50.9% improvement in interdisciplinary communication skills shows that this approach is effective in preparing students to face 21st-century challenges that require cross-field competencies.

Contextual Contributions

This research has particular relevance in the context of multicultural and multilingual Indonesian education. The strengthening of local cultural identity through Javanese language integration while developing global competence through English shows that education can serve as a bridge between locality and globality.

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