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Analysis of the Effectiveness of Collaborative Learning in Enhancing Academic Achievement in Junior High Schools

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Abstract

Collaborative learning has gained significant attention as an effective pedagogical approach in fostering academic achievement and 21st-century skills among students. This study aims to analyze the effectiveness of collaborative learning in improving student outcomes at the junior high school level. Employing a qualitative research design, this article synthesizes findings from recent studies published within the last five years to explore how collaborative learning impacts academic performance, engagement, and skill development. The analysis reveals that collaborative learning enhances students' academic outcomes by promoting deeper comprehension and critical thinking through peer interaction and cooperative problem-solving. Furthermore, it increases student engagement and motivation by creating participatory and interactive learning environments. Beyond academic benefits, collaborative learning also develops essential skills such as communication, teamwork, and adaptability, which are crucial for success in the 21st century. However, challenges such as unequal participation within groups and the need for effective teacher facilitation remain key barriers to its implementation. This study discusses strategies to address these challenges, including designing tasks that foster positive interdependence, providing clear roles within groups, and leveraging technology to enhance collaboration. The findings underscore the transformative potential of collaborative learning in junior high schools while highlighting areas for improvement and further research. By integrating collaborative learning effectively into classroom practices, educators can create meaningful learning experiences that prepare students for academic success and future professional demands.

Keywords: collaborative, effective, learning

I. INTRODUCTION

The landscape of education is continuously evolving, driven by the need to equip students with the skills necessary to thrive in an increasingly complex and interconnected world (Anas et al., 2024). Traditional pedagogical approaches, characterized by teacher-centered instruction and passive learning, are increasingly being replaced by more interactive and student-centered methodologies. Among these innovative approaches, collaborative learning has emerged as a prominent strategy that not only enhances academic achievement but also fosters critical skills essential for success in the 21st century (Suyato et al., 2024).

Collaborative learning can be defined as an instructional method that involves students working together in small groups to achieve common learning goals. This approach encourages active participation, peer interaction, and shared responsibility for learning outcomes. As noted by Shimizu et al., (2021), collaborative learning promotes positive interdependence among learners, where each member's success is linked to the success of the group. This sense of community fosters accountability, motivation, and engagement, which are crucial components of effective learning environments (Shimizu et al., 2021).

(Cagatan & Quirap, 2024). In today's globalized society, students must develop a range of competencies that include critical thinking, communication, teamwork, and adaptability. According to the World Economic Forum (2020), these skills are vital for navigating the complexities of modern workplaces and addressing societal challenges. Collaborative learning provides an ideal platform for students to cultivate these competencies through meaningful interactions with their peers.

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The theoretical underpinnings of collaborative learning are rooted in socio-constructivist theories of education. Vygotsky's concept of the Zone of Proximal Development (ZPD) is particularly relevant in this context. Vygotsky in Song & Wang (2024) posted that learners progress most effectively when they engage with peers who are slightly more knowledgeable or skilled. This interaction allows students to stretch their cognitive abilities while receiving support from their peers (Song & Wang, 2024). As Chen et al., (2024) emphasize, collaborative learning environments create opportunities for dialogue and negotiation of meaning, leading to deeper understanding and retention of knowledge (CHEN et al., 2024).

Furthermore, the theory of social interdependence proposed by Wulandari et al., (2024) highlights the significance of group dynamics in collaborative learning. Positive interdependence occurs when group members perceive that their individual contributions are essential for achieving collective goals. This perception fosters cooperation and encourages students to support one another in the learning process (Wulandari et al., 2024).

Recent years have witnessed a surge in research exploring the effectiveness of collaborative learning across various educational contexts. Studies have shown that this approach not only enhances academic performance but also improves student engagement and motivation. For instance, Almonia (2024) found that students who participated in collaborative learning activities demonstrated higher achievement levels in science assessments compared to those who engaged in traditional instructional methods (Almonia, 2024).

Moreover, the integration of technology into collaborative learning has further transformed its implementation. Digital tools such as online discussion forums, collaborative software, and virtual classrooms enable students to collaborate beyond physical boundaries. This flexibility allows for diverse interactions and enriches the collaborative experience. As education becomes increasingly digitized, understanding how technology can enhance collaborative learning is essential for educators seeking to create effective learning environments (Nazeef et al., 2024).

Despite its numerous benefits, implementing collaborative learning is not without challenges. One significant issue is the phenomenon of unequal participation within groups, often referred to as "free riding." In some instances, certain group members may contribute less than others, relying on their peers to carry the workload (Raharjo et al., 2024). This imbalance can lead to frustration among more engaged students and may undermine the overall effectiveness of collaborative activities.

Another challenge lies in the necessity for effective teacher facilitation. Educators play a crucial role in guiding collaborative processes by establishing clear expectations, providing structured tasks, and monitoring group dynamics (Nazeef et al., 2024)s. Without proper guidance, groups may struggle with communication issues or fail to achieve their intended learning outcomes.

II. METHODS

This study employs a qualitative research design to analyze the effectiveness of collaborative learning in enhancing academic achievement, engagement, and skill development among junior high school students. The qualitative approach was chosen because it allows for a deeper exploration of the contextual and experiential aspects of collaborative learning, focusing on how and why this pedagogical strategy influences student outcomes. This section outlines the research design, data collection methods, data analysis procedures, and the criteria used to ensure the validity and reliability of the findings.

Research Design

The study adopts a qualitative meta-synthesis approach, which involves systematically reviewing and synthesizing findings from recent empirical studies on collaborative learning. Meta-synthesis is particularly suitable for this study as it enables the integration of diverse perspectives from multiple studies to generate a comprehensive understanding of the phenomenon (Jung, 2024). By analyzing existing research published within the last five years, this methodology provides insights into current trends, challenges, and best practices in implementing collaborative learning at the junior high school level.

The scope of this study is limited to peer-reviewed journal articles, books, and credible academic sources published between 2019 and 2024. The focus is on studies conducted in junior high school settings, specifically those that examine the relationship between collaborative learning and academic performance, engagement, or skill development. Studies that include other educational levels (e.g., primary or tertiary education) were excluded unless they provided significant insights relevant to junior high schools.

Data Collection

Literature Search Strategy

The data for this study were collected through a systematic search of academic databases, including Google Scholar, Scopus, ERIC (Education Resources Information Center), and SpringerLink. Keywords such as "collaborative learning,"

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"academic achievement," "junior high school," "student engagement," "21st-century skills," and "qualitative analysis" were used to identify relevant studies. Boolean operators (e.g., AND, OR) were employed to refine search results and ensure comprehensive coverage of the topic.

Data Analysis

Thematic analysis was employed to analyze the data extracted from the selected studies. This method involves identifying recurring themes or patterns across multiple datasets to provide a rich understanding of the phenomenon under investigation (Braun & Clarke, 2021):

III. RESULTS AND DISCUSSION

A. *Research Result*

The analysis of recent studies on collaborative learning in junior high schools reveals several key findings regarding its effectiveness in enhancing academic achievement, engagement, and skill development. This section presents the results organized into four main themes: academic performance, student engagement, development of 21st-century skills, and challenges in implementation.

Collaborative learning has demonstrated a significant positive impact on students' academic performance across various subjects, particularly in science and mathematics.

Table 1: Impact of Collaborative Learning on Academic Performance

Subject	**Sample Size**	**Grade Level**	**Performance Improvement**
Science	50	Grade 5	+15%
English	60	Grade 7	+12%
Mathematics	75	Grade 8	+18%

Almonia's (2024) study on 50 grade 5 pupils revealed that students engaged in collaborative learning outperformed those in individualized learning settings by 15% on science assessments. The study attributed this improvement to increased interaction and cooperative problem-solving among students (Almonia, 2024).

Similarly, Raharjo et al. (2024) found a 12% improvement in English speaking skills among junior high school students in Takalar when implementing cooperative learning methods. The researchers noted that the consistent use of collaborative approaches transformed the teacher's role from a knowledge transmitter to a facilitator, promoting active learning and student engagement (Raharjo et al., 2024).

In mathematics, Nazeef et al., (2024) reported an 18% increase in test scores for 8th-grade students participating in collaborative learning activities compared to traditional instruction methods. The researchers emphasized that carefully designed tasks and proper facilitation were crucial in achieving these positive outcomes (Nazeef et al., 2024).

The Education Endowment Foundation (EEF) synthesis of multiple studies indicates that the effects of collaborative learning are slightly higher in secondary schools (+6 months) than in primary schools (+5 months). This suggests that junior high school students may be particularly well-suited to benefit from collaborative learning approaches.

B. *Student Engagement*

Collaborative learning has been shown to significantly enhance student engagement and motivation across various subjects and contexts.

Table 2: Impact of Collaborative Learning on Student Engagement

Engagement Measure	**Sample Size**	**Grade Level**	**Improvement**
Participation Rate	120	Grades 6-8	+25%
Self-reported Motivation	90	Grade 7	+30%
Time on Task	100	Grade 8	+20%

Akbar's (2024) comprehensive literature review on elementary and junior high school students found that collaborative learning methods increased student participation rates by an average of 25%. The study highlighted that active engagement in group discussions and problem-solving activities contributed to this improvement (Akbar, 2024).

Nazeef et al., (2024) reported a 30% increase in self-reported motivation among 7th-grade students when participating in collaborative learning activities. The researchers noted that the social aspect of learning and the shared responsibility for outcomes were key factors in boosting student motivation (Nazeef et al., 2024).

Volume 04, Issue 01, January-June 2025
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Suyato et al. (2024) observed a 20% increase in time on task for 8th-grade students engaged in collaborative learning compared to traditional instruction. The study emphasized that well-structured collaborative tasks kept students more focused and actively involved in the learning process (Suyato et al., 2024).
The EEF report supports these findings, noting that tasks and activities need to be carefully designed to ensure that working together is effective and efficient. This careful design helps prevent situations where some pupils may struggle to participate or attempt to work independently.

C. *Development of 21st-Century Skills*
Collaborative learning has proven effective in fostering essential 21st-century skills, including communication, critical thinking, and teamwork.

Table 3: Impact of Collaborative Learning on 21st-Century Skills Development

Skill	Study	Sample Size	Grade Level	Improvement
Communication	Raharjo et al. (2024)	60	Grade 7	+35%
Critical Thinking	Almonia (2024)	50	Grade 5	+28%
Teamwork	Boonstra et al. (2024)	75	Grade 8	+40%

Raharjo et al. (2024) reported a 35% improvement in communication skills among 7th-grade English language learners engaged in collaborative activities. The study noted that pair work and group presentations were particularly effective in developing these skills (Raharjo et al., 2024).
Almonia's (2024) research demonstrated a 28% increase in critical thinking abilities among 5th-grade science students participating in collaborative learning. The study attributed this improvement to the opportunities for students to analyze concepts collectively and engage in peer-to-peer questioning (Almonia, 2024).
Nazeef et al. (2024) observed a 40% enhancement in teamwork skills among 8th-grade mathematics students involved in collaborative problem-solving tasks. The researchers emphasized the importance of structured group activities and clear role assignments in fostering effective collaboration (Nazeef et al., 2024).
The EEF report corroborates these findings, stating that collaborative learning approaches are particularly promising when used to teach science, with an average impact of +10 months progress. This suggests that the nature of scientific inquiry may be especially conducive to collaborative learning methods.

D. *Discussion*
The results of this meta-synthesis provide compelling evidence for the effectiveness of collaborative learning in enhancing academic achievement, student engagement, and the development of essential 21st-century skills in junior high schools. The findings are consistent with broader research on collaborative learning, which suggests that this pedagogical approach can transform the learning environment, fostering active participation, deeper understanding, and improved student outcomes (Song & Wang, 2024). This section delves deeper into the implications of these findings, addressing the underlying mechanisms through which collaborative learning achieves its effects, comparing and contrasting the results with existing literature, and exploring the practical implications for educators.
The positive impact of collaborative learning on academic performance can be attributed to several key mechanisms. First, collaborative activities promote active learning by encouraging students to engage directly with the material, rather than passively receiving information (Sitorus et al., 2025). When students discuss concepts, explain their reasoning, and debate different perspectives, they construct a deeper and more nuanced understanding of the subject matter. Second, collaborative learning fosters cognitive elaboration, which involves processing information in more detail and connecting new knowledge to existing frameworks. By articulating their thoughts and responding to feedback from peers, students are forced to refine their understanding and identify gaps in their knowledge (Suyato et al., 2024).
Furthermore, collaborative learning leverages the power of peer support and scaffolding. Students often find it easier to seek help from peers than from teachers, creating a more comfortable and accessible learning environment. Peer tutoring can be particularly effective, as students who explain concepts to their classmates reinforce their own understanding while providing valuable assistance to others (Regis et al., 2025). The Zone of Proximal Development (ZPD) underscores this point; students learn best when interacting with peers who are slightly more knowledgeable, facilitating cognitive growth through guided participation (Song & Wang, 2024).
However, the effectiveness of collaborative learning in enhancing academic performance is also contingent on contextual factors. The design of collaborative tasks, the composition of groups, and the level of teacher facilitation all play crucial roles in determining outcomes. For instance, if tasks are poorly structured or lack clear objectives, students may struggle to focus their efforts and achieve the desired learning outcomes. Similarly, if groups are not diverse in terms of skills and

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perspectives, students may miss out on opportunities for cognitive conflict and deeper understanding (Raharjo et al., 2024).

Collaborative learning has been shown to significantly enhance student engagement by creating more interactive, participatory, and socially supportive learning environments. Engagement, in this context, encompasses not only academic involvement but also emotional and social dimensions (Akbar, 2024). When students work together, they develop a sense of belonging and shared purpose, which can increase their motivation and commitment to learning. Collaborative activities provide opportunities for students to express their ideas, receive feedback from peers, and contribute to a common goal, all of which can boost their self-esteem and confidence.

The social dynamics of collaborative learning also play a key role in fostering engagement. Students are more likely to be motivated and actively involved when they feel connected to their peers and perceive their contributions as valued (Cadavis, 2024). Collaborative activities can help build positive relationships among students, reducing feelings of isolation and promoting a sense of community. This is particularly important for students who may struggle with social interactions or feel marginalized in traditional classroom settings.

Moreover, collaborative learning can increase student engagement by providing opportunities for choice and autonomy. When students have a say in how they approach a task or how they allocate roles within their group, they are more likely to feel ownership over their learning and take responsibility for their outcomes. Allowing students to choose their collaborative partners can also enhance engagement, as students are more motivated to work with peers they like and trust (Suyato et al., 2024).

pThe ability to foster essential 21st-century skills, such as communication, critical thinking, and teamwork, is one of the most compelling arguments for collaborative learning. In today's rapidly changing world, students need more than just factual knowledge; they need the ability to think critically, solve problems creatively, and collaborate effectively with others. Collaborative learning provides an ideal platform for developing these skills by creating opportunities for students to practice them in real-world contexts.

Effective communication is essential for success in both academic and professional settings. Collaborative activities require students to articulate their ideas clearly, listen actively to others, and negotiate different perspectives. This process helps students develop their communication skills, including verbal and nonverbal communication, as well as the ability to adapt their communication style to different audiences (Raharjo et al., 2024).

Critical thinking is another key skill that is fostered through collaborative learning. When students work together to solve problems, they must analyze information, evaluate evidence, and make reasoned judgments. Collaborative activities can promote critical thinking by encouraging students to question assumptions, consider alternative viewpoints, and engage in constructive debate. This process helps students develop their critical thinking skills and the ability to make informed decisions (Almonia, 2024)

Teamwork is also a crucial skill in today's collaborative world. Collaborative activities provide opportunities for students to learn how to work effectively in teams, including how to set goals, allocate roles, manage conflicts, and share responsibilities. This process helps students develop their teamwork skills and the ability to contribute to a common goal (Nazeef et al., 2024).

Despite the numerous benefits of collaborative learning, several challenges can hinder its successful implementation. One of the most common challenges is unequal participation, or "free-riding," where some students contribute less than others, relying on their peers to carry the workload. This can lead to frustration among more engaged students and undermine the overall effectiveness of collaborative activities. To address this challenge, educators can implement strategies such as structured role assignments, individual accountability measures, and peer evaluation systems.

Another challenge is the need for effective teacher facilitation. Teachers play a crucial role in guiding collaborative processes by establishing clear expectations, providing structured tasks, and monitoring group dynamics. However, many teachers lack the training and experience necessary to effectively facilitate collaborative learning (Raharjo et al., 2024). To address this challenge, schools can provide targeted professional development to enhance teachers' skills in managing group dynamics, guiding collaborative processes, and providing constructive feedback.

Time management is another common challenge in collaborative learning. Collaborative activities often take longer than traditional instruction methods, which can put pressure on teachers to cover all the required content. To address this challenge, educators can carefully design collaborative activities, set clear time limits for each phase of collaborative work, and prioritize tasks based on their importance and impact on student learning (Almonia, 2024)

The findings of this meta-synthesis are consistent with a vast body of research on collaborative learning. Studies have consistently shown that collaborative learning enhances academic performance, student engagement, and the development of essential skills (Johnson & Johnson, 2009; Slavin, 1996). However, this meta-synthesis also provides new insights by focusing specifically on junior high schools and by examining recent research published within the last five years.

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The results of this study align with the Education Endowment Foundation (EEF) findings, which suggest that collaborative learning has a positive impact on student outcomes but requires careful implementation to maximize its effectiveness. The challenges identified in this study, such as unequal participation and the need for effective teacher facilitation, are also consistent with concerns raised in the existing literature (’Aini et al., 2024).

The findings of this meta-synthesis have several important implications for educators seeking to implement collaborative learning in junior high schools. First, it is essential to carefully design collaborative tasks to ensure that they are aligned with learning objectives, engaging for students, and structured to promote active participation. Tasks should be designed to foster positive interdependence, where students perceive their success as linked to the success of their peers.

Second, educators should provide clear guidelines and expectations for collaborative work. Students need to understand what is expected of them, how their work will be evaluated, and how they can contribute effectively to their group. It is also important to establish norms for respectful communication and constructive feedback.

Third, teachers should actively facilitate collaborative processes by monitoring group dynamics, providing guidance and support, and addressing conflicts. Teachers should also provide feedback to students on their collaborative skills, helping them to improve their communication, critical thinking, and teamwork abilities.

Fourth, schools should invest in professional development to enhance teachers' skills in implementing collaborative learning. Teachers need training in how to design effective collaborative tasks, facilitate group discussions, and manage classroom dynamics. They also need opportunities to collaborate with their peers and share best practices.

Finally, schools should create a supportive classroom culture that values collaboration and teamwork. This involves promoting a sense of community, encouraging students to support one another, and celebrating collective achievements.

IV. CONCLUSIONS

the findings of this meta-synthesis support the use of collaborative learning as an effective strategy for enhancing academic achievement, student engagement, and the development of essential 21st-century skills in junior high schools. By carefully designing collaborative tasks, providing clear guidelines and expectations, actively facilitating collaborative processes, investing in professional development, and creating a supportive classroom culture, educators can harness the full potential of this pedagogical approach to transform the learning environment and improve student outcomes. Future research should explore the long-term impacts of collaborative learning on student success and investigate the role of technology in enhancing collaborative learning experiences.

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