Collaborative Learning as a Pedagogical Strategy to Foster Interpersonal Communication Skills among Senior High School Students

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Abstrak

This study investigates the effectiveness of collaborative learning in enhancing interpersonal communication skills among senior high school students in Jember, Indonesia. Employing a quasi-experimental design with 120 participants from four classes, the research utilized a mixed-methods approach. Quantitative data were collected through pre- and post-tests using a validated communication skills questionnaire, while qualitative insights were gathered from classroom observations and semi-structured student interviews. ANCOVA results revealed a significant improvement in the experimental group's post-test scores from pre-test (M = 68.45, SD = 6.92) to post-test (M = 82.73, SD = 5.87), while the control group exhibited only a marginal improvement (pre-test M = 67.90, SD = 6.75; post-test M = 70.12, SD = 6.33)., indicating the effectiveness of the intervention. Qualitative findings further highlighted increased student confidence, peer support, and active listening. These outcomes align with sociocultural and cooperative learning theories, emphasizing the role of structured peer interaction in communication skill development. This study contributes to both educational theory and classroom practice by providing empirical evidence for collaborative learning as a viable strategy to nurture 21st-century communication competencies. It recommends the systematic integration of collaborative learning into instructional practices and the provision of targeted teacher training to ensure sustainable pedagogical impact.

Keyword : Pembelajaran Kolaboratif, Strategi Pedagogis, Komunikasi Interpersonal

Introduction

The era of rapid globalization and digital transformation has fundamentally changed the educational landscape, demanding an adjustment of the learning paradigm that not only emphasizes cognitive mastery, but also the development of essential 21st century competencies (Geisinger, 2016). Among these competencies, interpersonal communication skills are very important as a foundation for future academic and professional success (Pattiasina et al., 2025). In this context, collaborative learning is present as a potential pedagogical strategy to facilitate the development of interpersonal communication skills in high school students who are in a critical phase of identity formation and social skills (Pedone, 2016). Collaborative learning is defined as an educational approach in which students interact in small groups to help each other understand and solve problems (Järvelä et al., 2013).

Interpersonal communication skills not only include verbal and non-verbal abilities in conveying messages, but also include skills in active listening, negotiating, resolving conflicts, and understanding the social and cultural context in interactions(Bowman et al., 2010). Longitudinal research conducted by (Deming, 2017) shows that since 1980, jobs requiring high social skills have experienced a 24% growth, while jobs with low social skills have shown a significant decline. These data emphasize the urgency of developing interpersonal communication skills in the contemporary education system. According to (Lin et al., 2019), the high school environment is an ideal context for developing these skills, considering that at this stage students are in a transition period towards adulthood, where the formation of identity and interpersonal skills is at a critical stage.

The effectiveness of collaborative learning in improving interpersonal communication skills has become a concern for a number of researchers. (Gillies, 2019a) in his study involving 240 high school students in Australia found a positive correlation between the implementation of collaborative learning and improved communication skills, especially in terms of argumentation skills, active listening, and providing constructive feedback..

In the Indonesian context, research on collaborative learning and interpersonal communication skills development is still limited, especially at the high school level(Wagino et al., 2023). Reality shows that although culturally Indonesian society values togetherness and mutual cooperation, the implementation of learning in schools is still dominated by a traditional teacher-centered approach (Rosser & Fahmi, 2018). This situation creates a contradiction between cultural values and educational practices, so that the exploration of the implementation of collaborative learning in the Indonesian context becomes increasingly relevant and urgent (Arta, 2019).

The post-COVID-19 pandemic era has given rise to a new urgency in developing students' interpersonal communication skills. The results of a study conducted by(AlKhamaiseh, 2022) on 1,250 students in five different countries showed a significant decline in face-to-face communication skills as a result of prolonged distance learning. In Indonesia itself,(Suryaman et al., 2020) found that 68% of the 723 students who were respondents to the study reported difficulty in interacting effectively with peers after returning to face-to-face learning post-pandemic. This phenomenon indicates an urgent need for pedagogical strategies that can facilitate the reconstruction of students' interpersonal communication skills, and collaborative learning is seen as one promising approach (Scull et al., 2020).

Cultural aspects in the implementation of collaborative learning also need serious attention. (Cheng, 2021) in a comparative study between secondary schools in China and the United States found that the effectiveness of collaborative learning in developing interpersonal communication skills is greatly influenced by the cultural context. In countries with a collectivist orientation such as China, collaborative learning tends to be more effective in developing non-confrontational and harmonious communication skills, while in countries with an individualist orientation such as the United States, this approach is more successful in developing argumentation and assertiveness skills. The implication of this finding is that the implementation of collaborative learning in Indonesia, as a country with a strong collectivist orientation, needs to pay attention to cultural aspects to maximize its effectiveness in developing comprehensive interpersonal communication skills (Barman & Jena, 2023).

The development of digital technology opens up new dimensions in the implementation of collaborative learning for the development of interpersonal communication skills. (Ryberg & Davidsen, 2017) highlighted how digital technology can expand the scope of collaborative learning through online collaboration platforms, virtual simulations, and networked learning communities. However,(Al-Ataby, 2020) warned that over-reliance on technology can be counterproductive to the development of essential face-to-face communication skills. Therefore, a blended collaborative learning approach that integrates face-to-face interaction and technological support proportionally is seen as the most ideal model (Dillenbourg et al., 2007). In Indonesia, this challenge is increasingly complex considering the digital divide that is still a reality in various regions, so the adaptation of the blended collaborative learning approach

needs to pay attention to the socio-economic context and available technological infrastructure (Wijaya, 2021).

The integration of digital technologies in education has transformed collaborative learning, offering new opportunities to foster interpersonal communication skills Ryberg & Davidsen, (2017)emphasized how digital tools such as online collaboration platforms, virtual simulations, and networked learning communities can expand the reach and depth of peer interaction. However, Al-Ataby, (2020)) cautioned that excessive reliance on technology may hinder the development of crucial face-to-face communication skills. To address this tension,. Dillenbourg et al., (2007) proposed a blended collaborative learning model that balances digital interaction with in-person engagement. In the Indonesian context, implementing such a blended model presents unique challenges due to the persistent digital divide across socio-economic and geographic lines (Wijaya, 2021). Therefore, adapting blended collaborative learning in Indonesia requires careful consideration of local technological infrastructure and equitable access to digital resources.

Effective implementation of collaborative learning for the development of interpersonal communication skills requires the design of structured and differentiated learning activities. (Knight et al., 2019) proposed the "Thinking Together" framework that emphasizes the development of dialogue skills in a collaborative context through structured activities such as collaborative problem-solving, structured academic controversy, and reciprocal teaching.(Chen et al., 2019) added that collaborative learning activities need to be designed by considering heterogeneity in groups, both in terms of academic ability, socio-cultural background, and learning style to maximize the development of interpersonal communication skills.

In this study, we seek to explore the effectiveness of collaborative learning as a pedagogical strategy to foster interpersonal communication skills in high school students in Indonesia. Based on a comprehensive literature review, we identified a significant gap in research related to the implementation of collaborative learning in the Indonesian educational context, particularly focusing on the development of interpersonal communication skills. This study will provide theoretical and practical contributions by: (1) developing a collaborative learning model that is adaptive to the Indonesian socio-cultural context; (2) identifying factors that facilitate or hinder the effectiveness of collaborative learning in the development of interpersonal communication skills; (3) developing practical recommendations for educators and policy makers in implementing collaborative learning as a pedagogical strategy to foster interpersonal communication skills in high school students. Through a mixed-method approach that integrates experimental design with in-depth qualitative analysis, this study aims to generate a holistic understanding of the dynamics of collaborative learning and the development of interpersonal communication skills in the contemporary Indonesian educational context..

Literature Review
Collaborative Learning in Secondary Education: Strategies and Practices
Collaborative learning has emerged as an influential pedagogical paradigm in the context of secondary education, referring to an instructional method in which learners work in small groups to achieve a shared learning goal (Peña-Ayala, 2021). This learning model focuses on the social construction of knowledge through negotiation of meaning and cognitive elaboration facilitated by interactions between learners. According to a meta-analysis conducted by Hattie (2020), collaborative learning showed an effect size of 0.78, indicating a substantial positive impact on improving student learning outcomes. The implementation of this strategy involves the establishment of positive interdependence, individual accountability, promotive interactions, social skills, and group processing (Gillies, 2019b). As articulated by (Koten et al., 2016), the effectiveness of collaborative learning in the context of secondary education depends on designing learning tasks that require high levels of cognitive engagement and setting up a social environment that supports productive dialogue and exchange of perspectives among learners..

Empirical exploration of collaborative learning practices in secondary education reveals variations in implementation modalities and their effectiveness depending on context. According to a longitudinal study conducted by (Liao et al., 2019), technology can facilitate collaborative learning through digital platforms that allow learners to engage in shared knowledge construction that is not limited by temporal and spatial boundaries. The results of this study indicate significant improvements in students' critical thinking skills, problem-solving abilities, and digital literacy. However, research (Hakim & Abidin, 2024) identifies substantial challenges in implementing collaborative learning, including heterogeneity of participation, difficulties in orchestrating group activities, and the complexity of evaluating individual contributions in collaborative tasks. Recommended interventions to address these challenges include the development of appropriate scaffolding, the use of comprehensive assessment strategies, and teacher training in facilitating productive group dynamics (van de Pol et al., 2019). In line with the socio-constructivist perspective, collaborative learning not only serves as a pedagogical strategy but also as a vehicle for cultivating interpersonal skills and professional dispositions that are essential for success in the 21st century knowledge-based society paradigm (van de Pol et al., 2019)

Interpersonal Communication Skills and Their Role in the Teaching and Learning Process

Interpersonal communication skills are a fundamental component in the educational ecosystem that includes the ability to transmit, receive, and interpret messages effectively in the context of social interactions between educators and learners (DeVito, 2001). Contemporary conceptualizations of these skills include verbal and non-verbal aspects that each contribute significantly to the quality of pedagogical interactions. According to a longitudinal study conducted by (Hattie, 2025), there is a strong positive correlation ($r = 0.72$) between teachers' interpersonal communication skills and students' academic achievement. The study identified essential components of effective interpersonal communication in the learning context, including instructional clarity, cognitive empathy, emotional resonance, dialogic openness, and responsiveness to individual learner needs. In line with the socio-constructivist perspective, (Frymier et al., 2019) asserted that communicative exchanges in the learning environment serve as key facilitators in the process of collective knowledge construction and the development of deep conceptual understanding. Meta-synthesis analysis by Wubbels et al. (2022) revealed that educators' interpersonal communication skills not only influence the cognitive dimensions of learning, but also play a significant role in forming a psychological classroom climate that is conducive to intellectual exploration and socio-emotional development of students..

The strategic implementation of interpersonal communication skills in the teaching-learning process provides multidimensional implications that go beyond academic content transactions. An empirical study conducted by (Orakcı et al., 2023) demonstrated that educators with differentiated interpersonal communication skills are able to adapt their instructional modalities according to the learning styles, developmental needs, and sociocultural characteristics of diverse learners. This investigation revealed significant increases in learning engagement (effect size = 0.89), intrinsic motivation (effect size = 0.76), and academic self-efficacy (effect size = 0.83) in learners taught by educators with high interpersonal communication proficiency. Complementary research by (Sibua Casukkas Martin, 2019) elaborated that interpersonal communication skills also play an integral role in the development of collaborative and resilient learning communities, characterized by positive interdependence, productive exchange of perspectives, and constructive cognitive conflict resolution.

This finding is supported by a study (Deveeci, 2019) that articulates a reciprocal relationship between effective interpersonal communication and the development of learners' metacognitive competencies, including self-regulation, reflective thinking, and epistemic awareness. Thus, it can be concluded that interpersonal communication skills represent a critical nexus between pedagogical effectiveness and educational transformation, where the systematic development of these skills in educator preparation and professional development programs is imperative to facilitate meaningful and transformative learning

experiences in an era of increasing sociocultural complexity and cognitive diversity (Darling-Hammond et al., 2020)(Darling-Hammond et al., 2020).

Methodology (Metodologi)

This study employed a quasi-experimental research design with a non-equivalent control group, aiming to explore the effectiveness of collaborative learning in enhancing students' interpersonal communication skills. The design was chosen due to its suitability in natural classroom settings where random assignment is not feasible. The intervention was implemented over eight weeks, integrating structured collaborative learning tasks into the regular curriculum of selected classes. Each session was designed to facilitate active peer interaction, shared responsibilities, and mutual goal setting. The research focused on capturing both cognitive and behavioral aspects of communication, ensuring a holistic understanding of the interpersonal skill development process.

Participants in this study comprised 120 senior high school students from four Grade 11 classes in Jember Regency, East Java, Indonesia. The classes were selected through purposive sampling from two different schools that shared similar academic standing and socio-cultural environments. Two classes were assigned as the experimental group receiving the collaborative learning intervention, while the remaining two served as the control group and continued with traditional instruction methods. Ethical considerations were strictly followed, including informed consent from participants, confidentiality assurances, and alignment with institutional research ethics protocols.

Data were collected using a mixed-methods approach. Quantitative data were obtained through a standardized interpersonal communication skills questionnaire administered in pre-test and post-test phases. The instrument was validated through expert judgment and demonstrated high internal consistency (Cronbach's alpha = 0.87). In addition, qualitative data were gathered via classroom observations and semi-structured interviews with selected students to gain deeper insight into their collaborative experiences. Quantitative data were analyzed using paired and independent sample t-tests to determine statistical significance, while thematic analysis was employed to interpret qualitative findings. This methodological triangulation enriched the validity of the results and enabled a nuanced understanding of how collaborative learning strategies contribute to communication skill development among high school students.

Results

The analysis of data was conducted in three stages: descriptive statistics, inferential analysis, and qualitative findings. This triangulated approach provided both numerical and contextual insights into the effectiveness of collaborative learning strategies on students' interpersonal communication skills.

Descriptive Statistics

Descriptive statistics were employed to examine the distribution of students' communication skills scores before and after the intervention. The experimental group showed a substantial increase in mean scores from pre-test (M = 68.45, SD = 6.92) to post-test (M = 82.73, SD = 5.87), while the control group exhibited only a marginal improvement (pre-test M = 67.90, SD = 6.75; post-test M = 70.12, SD = 6.33). This initial comparison suggested that collaborative learning may have had a significant impact on improving interpersonal communication skills among the experimental group students.

Table 1 Descriptive statistics to test the distribution of students' communication skills.

Group	Test	Mean (M)	Standard Deviation (SD)
Experimental Group	Pre-Test	68.45	6.92
Experimental Group	Post-Test	82.73	5.87
Control Group	Pre-Test	67.90	6.75
Control Group	Post-Test	70.12	6.33

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Inferential Analysis

To assess whether the observed differences in communication skill scores were statistically significant, a paired sample t-test was performed within each group, followed by an independent sample t-test between groups. The experimental group showed a significant improvement ($t(59) = 11.36$, $p < 0.001$), while the control group did not show statistically meaningful gains ($t(59) = 1.98$, $p = 0.053$). An independent t-test comparing post-test scores between the experimental and control groups also revealed a statistically significant difference ($t(118) = 10.24$, $p < 0.001$), thereby supporting the hypothesis that collaborative learning significantly enhances interpersonal communication skills in senior high school students.

Table 2 collaborative learning of students' interpersonal communication skills

Comparison	t-value	p-value
Experimental Group (Pre vs. Post)	11.36	< 0.001
Control Group (Pre vs. Post)	1.98	0.053
Experimental vs. Control (Post-Test)	10.24	< 0.001

Qualitative Findings

Qualitative data derived from classroom observations and semi-structured interviews corroborated the quantitative findings. Students in the experimental group frequently described the collaborative learning sessions as "interactive," "engaging," and "helpful for learning to listen and express ideas." Observational notes highlighted increased peer dialogue, turn-taking, and negotiation of meaning in group tasks, all of which are key indicators of interpersonal communication skill development. For instance, one student noted, *"I used to be shy in group discussions, but now I feel more confident to speak because we help each other."*

Thematic analysis yielded three dominant themes: (1) increased student engagement, (2) improved peer respect and empathy, and (3) enhancement of verbal expression. Figure 1 presents a word cloud generated from interview transcripts, showing prominent terms such as *"collaboration," "listen," "express,"* and *"understand,"* which reflect the impact of the intervention on interpersonal communication

Table 3. Thematic Summary of Student Interview Responses on Collaborative Learning Experiences

Theme	Representative Quote	Description	Frequency (n=20)
1. Increased Confidence in Speaking	" I became more confident in speaking because my friends supported me during discussions."	Students reported feeling more confident to express their ideas during group discussions.	15
2. Active Listening and Respect	" I learned to listen to other people's opinions, not to interrupt immediately."	Collaborative tasks helped students develop active listening and respectful interaction.	13
3. Peer Support and Solidarity	" If you are confused, your group members will help you directly, so learning is easier.."	Students emphasized how peers helped them understand content and supported each other.	17
4. Motivation and Enjoyment	" Belajarnya lebih seru dan tidak membosankan karena kerjasama dengan teman."	The collaborative setting made learning more enjoyable and motivating.	14
5. Conflict Resolution Skills	" Sometimes there are differences of opinion, but we learn to reach consensus and find solutions together."	Students learned to manage disagreements constructively during collaborative tasks.	11

Discussion

Suggestions for Future Research.

The findings of this study revealed a significant improvement in students' interpersonal communication skills following the implementation of collaborative learning strategies. The quantitative analysis demonstrated a marked increase in the experimental group's post-test scores, while qualitative data highlighted themes such as increased confidence, active listening, and peer support. These results align with previous studies, such as (Gillies, 2019a) and (Johnson, 2002), which affirmed that structured group interactions enhance students' social and communication competencies by creating a space where they are encouraged to articulate ideas, negotiate meaning, and build mutual understanding. Similarly, a study by Tran and (Greenhow et al., 2021) reported improved classroom discourse and reduced communication anxiety when students were systematically engaged in collaborative tasks.

Connecting these empirical results to Vygotsky's sociocultural theory (1978), the development of interpersonal communication is deeply rooted in social interaction and the use of language as a mediating tool. Collaborative learning situates learners in the *Zone of Proximal Development* (ZPD), where peer scaffolding becomes essential for internalizing communication strategies. Through dialogue, feedback, and cooperative meaning-making, students extend their communicative competence beyond individual capabilities. The observed qualitative themes such as improved peer empathy and constructive conflict resolution illustrate the active internalization of interpersonal norms fostered through collaborative settings, consistent with Vygotsky's assertion that learning is fundamentally a social process.

Moreover, the research underscores the importance of well-structured group activities, as they foster a sense of responsibility, shared goals, and mutual respect—all of which are essential elements in communication development. These findings support(Slavin, 2014) theory of cooperative learning, which posits that interdependence and individual accountability within a group drive both cognitive and affective outcomes. The role of positive interdependence observed in this study—where students felt responsible not only for their own learning but also their peers'—was a key mechanism in enhancing both verbal and non-verbal communication skills.

In practical terms, this study provides actionable insights for educators aiming to develop students' interpersonal communication. Teachers should intentionally design collaborative tasks that require inter-student dialogue, such as peer teaching, group problem-solving, and project-based learning. Facilitators should also monitor group dynamics to ensure inclusive participation and equitable turn-taking. Scaffolding strategies—such as guiding questions, role assignments, and structured reflection—can further reinforce communication norms and ensure that every student is both a contributor and a listener. The presence of peer support and reciprocal feedback encourages hesitant students to take communicative risks, thereby nurturing a more confident classroom discourse.

Ultimately, this research reaffirms the pedagogical value of collaborative learning not only as a means to improve academic outcomes but also as a transformative strategy for building 21st-century communication competencies. In a globalized education context where interpersonal collaboration is increasingly central, fostering communication through intentional peer interaction becomes a vital responsibility for educators. Future studies may explore longitudinal effects of collaborative strategies or extend the model to diverse educational settings, providing deeper insight into how collaborative structures can sustain communication growth over time

Conclusion (Kesimpulan)

This study provides compelling evidence that collaborative learning serves as an effective pedagogical strategy for fostering interpersonal communication skills among senior high school students. The integration of structured group tasks within the classroom significantly improved students' ability to express

ideas, listen actively, and engage in respectful dialogue. The quantitative findings indicated statistically significant gains in communication skill scores among students who participated in collaborative learning activities, while qualitative data enriched these results by illustrating increased confidence, empathy, and peer support as emergent behaviors during collaborative sessions.

Theoretically, this research reinforces sociocultural learning frameworks, particularly Vygotsky's concept of the *Zone of Proximal Development*, by demonstrating that communication skills can be developed through meaningful social interaction and scaffolding within peer groups. The study also affirms and extends principles from cooperative learning theory by highlighting how structured interdependence and accountability within groups catalyze both cognitive and affective development. Practically, the findings contribute to the growing body of evidence that supports student-centered instructional approaches in secondary education, offering actionable strategies for educators to promote essential 21st-century skills.

Given its effectiveness, collaborative learning should be widely implemented as a core instructional method in secondary school curricula, particularly in subjects that emphasize discussion, interpretation, and teamwork. Educators are encouraged to adopt systematic planning in collaborative lesson design, including clear role assignments, dialogue protocols, and assessment rubrics that value communication processes alongside academic content. For broader adoption, institutional support in the form of professional development and curriculum integration is necessary to equip teachers with the skills to facilitate collaborative learning environments effectively

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