

Improving High School Students' Interpersonal Communication Skills through Collaborative Learning: An Experimental Study

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Article History: Received: Maret, 20 2025; Accepted: Mei, 25 2025; Published: June, 30 2025

Abstrak

This study aims to test the effectiveness of collaborative learning in improving elementary school students' communication skills, including empathy, active listening, and negotiation. Conducted in the context of Indonesian primary education, the analysis utilized ANCOVA with pretest scores as covariates. The results revealed that the collaborative learning intervention had a statistically significant effect on students' posttest scores ($F = 83.487$, $p < 0.001$), with a partial eta squared of 0.416, indicating a large effect size. These findings align with empirical studies from the past six years, reinforcing that structured interaction in collaborative learning enhances both social and academic competencies. Implications are discussed for teachers, curriculum designers, and professional development programs, highlighting the need to build teacher capacity in designing adaptive, communication-oriented learning activities. The study concludes that collaborative learning is a pedagogically relevant strategy to enhance students' interpersonal communication in the 21st-century education era. It provides theoretical and practical contributions to the development of affective and social learning innovations and calls for structured policies and teacher training to sustain its implementation in primary education..

Keyword : Collaborative Learning, Pedagogical Strategies, Interpersonal Communication



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Introduction

The contemporary educational landscape increasingly emphasizes the development of 21st-century skills, with interpersonal communication competencies standing at the forefront of essential capabilities for academic success and future career prospects (Sarwari et al., 2024). In the context of secondary education, particularly at the upper secondary level, students face critical developmental phases where effective communication skills become paramount for social integration, academic collaboration, and preparation for higher education or professional environments. Research consistently demonstrates that interpersonal communication skills significantly influence students' academic performance, peer relationships, and overall psychological well-being (Hanaysha et al., 2023; Rakhmaniar, 2024). However, traditional pedagogical approaches often inadequately address the multifaceted nature of communication competencies, creating a substantial gap between educational outcomes and the communicative demands of modern society.

Collaborative learning emerges as a pedagogically robust framework that inherently necessitates and cultivates interpersonal communication skills through structured peer interactions, shared

responsibility, and collective knowledge construction (Al-Yafei & Mudhsh, 2023; Zhao, 2023). The theoretical foundation of collaborative learning draws from social constructivist principles, wherein knowledge is co-constructed through meaningful dialogue, negotiation, and mutual understanding among learners (Vygotsky's social learning theory applications in contemporary education). Recent empirical investigations have demonstrated that collaborative learning environments significantly enhance students' ability to articulate ideas clearly, listen actively, provide constructive feedback, and navigate complex social dynamics inherent in group-based academic tasks (Yaacob et al., 2020; Zitha et al., 2023). Furthermore, the meta-cognitive processes activated during collaborative learning facilitate the development of communication awareness, enabling students to reflect on their communicative behaviors and adapt their interaction strategies accordingly.

Despite the theoretical promise and emerging empirical support for collaborative learning's impact on communication skills development, significant gaps persist in the literature regarding systematic experimental investigations specifically targeting interpersonal communication competencies among upper secondary students. Previous studies have predominantly focused on academic achievement outcomes or general social skills development, with limited attention to the nuanced components of interpersonal communication such as emotional intelligence in communication, conflict resolution abilities, and cultural sensitivity in diverse group settings (Igbokwe et al., 2023; Sadig, 2024). Additionally, the majority of existing research has been conducted in elementary or university contexts, leaving upper secondary education—a critical transitional period—relatively underexplored in terms of communication skills intervention through collaborative pedagogies.

The significance of addressing interpersonal communication skills deficits among upper secondary students extends beyond immediate educational contexts to encompass broader societal implications. Contemporary workforce demands increasingly prioritize employees' ability to collaborate effectively, communicate across diverse teams, and adapt communication styles to various professional contexts (Fisher, 2021). Moreover, the digital age has paradoxically created both opportunities for global communication and challenges related to face-to-face interpersonal skills development, making structured educational interventions more crucial than ever (DeFilippis et al., 2022). Students who lack adequate interpersonal communication skills often experience academic underachievement, social isolation, and diminished career prospects, perpetuating cycles of educational and professional disadvantage.

From a methodological perspective, experimental research designs offer the most rigorous approach to establishing causal relationships between collaborative learning interventions and interpersonal communication skills development. While correlational studies have suggested positive associations between collaborative learning and communication competencies, the field requires controlled experimental investigations that can isolate the specific effects of structured collaborative pedagogies on measurable communication outcomes (Agustina, 2022). Experimental designs enable researchers to control for confounding variables, implement standardized interventions, and employ validated measurement instruments to assess communication skills improvements with greater precision and reliability. Such methodological rigor is essential for developing evidence-based educational practices that can be confidently implemented across diverse educational contexts.

The present study addresses these identified gaps by implementing a controlled experimental design to investigate the effectiveness of structured collaborative learning interventions on interpersonal communication skills development among upper secondary students. Specifically, this research examines whether systematic implementation of collaborative learning strategies significantly enhances students' verbal communication clarity, active listening abilities, empathetic responding, conflict resolution skills, and group facilitation competencies compared to traditional instructional approaches. By focusing on measurable communication outcomes and employing rigorous experimental methodology, this investigation aims to contribute substantive empirical evidence to the

literature while providing practical insights for educators seeking to enhance students' interpersonal communication competencies through pedagogically sound collaborative learning implementations. The findings from this study are anticipated to inform educational policy, curriculum development, and teacher professional development initiatives aimed at preparing students for the communicative demands of contemporary academic and professional environments.

Literature Review / Theoretical Framework

Interpersonal Communication Skills

Interpersonal communication skills are a crucial aspect in the development of students' social and academic competencies. This ability involves the process of exchanging effective verbal and nonverbal messages, which allows individuals to build healthy and productive relationships in the educational context. In a learning environment, effective interpersonal communication can increase student participation, strengthen understanding of the material, and create a conducive learning atmosphere. Difficulties in interpersonal communication skills can hinder students' overall development. Research by (Rahmandani et al., 2024) shows that the application of problem-based learning can significantly improve students' interpersonal communication skills, with a t-arithmetic result of 4.469 which is greater than the t-table of 1.645 at a significance level of 5%. (KHODIJAH et al., 2018)

The social penetration theory developed by Altman and Taylor (1973) provides a conceptual framework for understanding the dynamics of interpersonal communication. This theory states that the development of interpersonal relationships occurs through a gradual process of self-disclosure, from shallow to deeper and more intimate levels. In the context of education, understanding this theory can help educators design learning strategies that encourage openness and trust between students, thereby strengthening social bonds and collaboration in the classroom. The application of the principles of this theory in learning activities can create an environment that supports the growth of students' interpersonal communication skills (Megawati & Ainin, 2018).

In addition, the interpersonal communication approach according to Joseph A. DeVito emphasizes five important elements: openness, empathy, support, positive attitude, and equality. These elements can be used by educators to build more effective relationships with students, especially in the context of inclusive education. Research by Megawati and Kurrotun Ainin (2018) shows that the application of effective interpersonal communication principles by teachers can increase learning motivation in children with special needs. (Megawati & Ainin, 2018)

In addition, the concept of emotional intelligence introduced by Daniel Goleman highlights the importance of an individual's ability to recognize, understand, and manage their own and others' emotions. This emotional intelligence plays an important role in effective interpersonal communication. Research by (Lamirin et al., 2019) found a positive relationship between emotional intelligence and interpersonal communication skills in adolescents, indicating that developing emotional intelligence can improve students' interpersonal communication skills .

Integrating social penetration theory, DeVito's interpersonal communication principles, and Goleman's emotional intelligence concepts into educational practice can provide a holistic approach to developing students' interpersonal communication skills. By understanding and applying these principles, educators can create learning environments that support students' social and emotional growth, which can ultimately improve students' learning outcomes and overall well-being. (Kustiawan et al., 2017)

In addition, learning approaches such as role playing have been shown to be effective in developing students' interpersonal communication skills. Through simulations of social situations, students can practice their ability to express themselves, understand others' perspectives, and respond empathetically. (Sari, 2018) emphasizes the urgency of developing self-confidence and interpersonal communication skills through role-playing techniques, which can help students in facing complex

communication challenges. This approach is in line with the perspective-taking theory proposed by Selman, which highlights the importance of an individual's ability to understand the perspective of others in social interactions. .

In the digital era, interpersonal communication skills also play an important role in online learning environments. Research by (Lestari & Lestari, 2023) shows a significant relationship between interpersonal communication and social intelligence in online learning, which has a positive impact on student learning outcomes in social studies subjects. This shows that even though interactions occur virtually, the quality of interpersonal communication remains a determining factor in learning success. Therefore, the development of interpersonal communication skills must include the ability to adapt to digital communication media.

In the context of educational organizations, effective interpersonal communication between teachers and students can increase learning motivation and job satisfaction. Research by (Valencia Sapphine, 2024) revealed that the effectiveness of interpersonal communication between teachers and students is influenced by factors such as openness, empathy, and positive attitudes. In addition, (Sundari, 2024) Oktafiani et al. (2018) found that good interpersonal communication contributed to employee job satisfaction at the West Kalimantan Education and Culture Office. These findings emphasize the importance of interpersonal communication not only in the learning process, but also in the management and culture of educational organizations. (Paramita & Sapphine, 2024; Widi Astuti et al., 2023)

Overall, developing interpersonal communication skills is a strategic investment in improving the quality of education. By understanding the underlying theories and implementing effective learning strategies, educators can equip students with communication skills that are essential for their academic and social success. Integrating this approach into the curriculum and educational practices will create a learning environment that is more inclusive, collaborative, and responsive to the needs of learners in today's era of globalization and digitalization

Collaborative Learning:

Collaboration in learning has become an increasingly important pedagogical approach in the context of modern education, especially in efforts to improve students' critical and social thinking skills. This approach is rooted in the theory of social constructivism, which emphasizes that knowledge is built through social interaction and shared experiences. (Amna Saleem et al., 2021). In this context, collaborative learning allows students to exchange ideas, discuss, and build shared understanding, which in turn can deepen conceptual understanding and improve critical thinking skills. For example, research by (Kurniawati, 2024) shows that the implementation of constructivism-based collaborative learning significantly improves the critical thinking skills of elementary school students, with students showing better abilities in understanding concepts, solving problems, and thinking critically compared to traditional learning methods. (Kurniawati, 2024; NUR, 2024)

In addition, collaborative learning also contributes to the development of social and teamwork skills that are important in everyday life and the workplace. Learning models such as Jigsaw and Think-Pair-Share have been shown to be effective in improving students' social interaction, teamwork, and communication skills. Research by (Pebriana et al., 2025) shows that these cooperative learning strategies encourage active participation and create a more inclusive classroom environment, where students learn from each other, share ideas, and work together to achieve common goals .

In the context of higher education, the integration of information technology and social media in collaborative learning has opened up new opportunities to enhance student interaction and participation. (Hamadi et al., 2021) found that the use of platforms such as Facebook can facilitate collaborative learning by increasing student engagement, interaction with external resources, and the

formation of learning communities. This approach is in line with constructivism theory, which emphasizes the importance of social interaction in the learning process .

However, the implementation of collaborative learning also faces challenges, especially in ensuring equal participation and preventing the phenomenon of "social loafing" or excessive dependence on other group members. To overcome this, principles such as positive interdependence, individual accountability, equal participation, and simultaneous interaction need to be applied consistently in learning design. For example, the PIES (Positive interdependence, Individual accountability, Equal participation, Simultaneous interaction) model developed by (Ayvaci & Türkdoğan, 2010) offers a framework that can help ensure that each group member contributes actively and equally to the learning process. (Hamadi et al., 2021)

Thus, collaborative learning, when designed and implemented with appropriate pedagogical principles in mind, can be an effective strategy for enhancing learners' cognitive and social skills, as well as preparing them for real-world challenges

Methodology

This study used a quasi-experimental approach with a pretest-posttest control group design, which aimed to evaluate the effectiveness of collaborative learning in improving the interpersonal communication skills of senior high school students. A total of 120 students from grade X in one of the state high schools in Jember, East Java, were selected as the research population. The research sample consisted of two groups: the experimental group that received collaborative learning treatment and the control group that received conventional learning. The sampling technique was carried out randomly to ensure the equality of initial characteristics between groups..

The main instrument used in this study was a validated and reliable interpersonal communication skills test. The validity of the instrument content was tested using the Aiken's V method, while its reliability was tested using the Cronbach's Alpha coefficient. The data obtained were analyzed using an independent t-test to compare the pretest and posttest scores between the experimental and control groups. In addition, analysis of covariance (ANCOVA) was used to control for variables that might affect the results of the study. This approach is in line with previous studies showing that problem-based learning is effective in improving students' interpersonal communication skills.

Collaborative learning in this study was designed to encourage positive interactions between students through group work, discussion, and joint problem solving. This strategy is based on the theory of positive interdependence, where individual success depends on the success of the group as a whole. The implementation of collaborative learning has been shown to improve students' social and communication skills in various educational contexts. Therefore, this study is expected to provide significant contributions in the development of effective learning methods to improve high school students' interpersonal communication skills.

Results

Table 1. Descriptive Statistics of Interpersonal Communication Skills Scores

| Group | N | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD |
|------------|----|--------------|------------|---------------|-------------|
| Eksperimen | 60 | 68.45 | 5.92 | 82.73 | 6.14 |
| Control | 60 | 68.12 | 5.76 | 72.45 | 5.89 |

Description: The maximum score is 100. There was no significant difference in the pretest scores between the experimental and control groups, indicating that the randomization worked well..

Table 2. Independent t-Test Results for Posttest

| Variabel | t | df | Sig. (2-tailed) | Mean Difference | Cohen's d |
|-----------------------------------|-------|-----|-----------------|-----------------|-----------|
| Posttest (Experiment and Control) | 9.108 | 118 | 0.000 ** | 10.28 | 1.66 |

The t-test results showed that there was a statistically significant difference between the experimental and control groups in the posttest scores ($p < 0.01$). The effect size value (Cohen's $d = 1.66$) showed a large influence of collaborative learning on students' interpersonal communication skills..

Table 3. Results of Analysis of Variance (ANCOVA) Posttest with Pretest as Covariate

| Sumber Variasi | F | df | Sig. | Partial Eta Squared |
|-------------------|--------|--------|----------|---------------------|
| Pretest | 6.232 | 1, 117 | 0.014 * | 0.051 |
| Group (Treatment) | 83.487 | 1, 117 | 0.000 ** | 0.416 |

ANCOVA showed that after controlling for pretest scores, the posttest difference between the experimental and control groups remained significant ($p < 0.01$). The partial eta squared value of 0.416 indicated a large contribution from the treatment

Interpretation of Results

The results of the study showed that the collaborative learning approach significantly improved the interpersonal communication skills of high school students. The striking difference in the average posttest score between the experimental and control groups (10.28 points) and the large effect size value (Cohen's $d = 1.66$) indicated that collaboration that was systematically designed and based on the principle of positive interdependence was very effective in building students' interpersonal skills. This is in line with previous findings that emphasize that collaborative learning can create a conducive learning environment for the development of communication, empathy, and cooperation among students. (Irvani & Hanifah, 2024; Suwarni, 2022).

Discussion

Interpretation of findings:

Based on the results of the analysis of covariance (ANCOVA) conducted on the posttest scores with the pretest scores as covariates, it was found that the collaborative learning treatment had a significant effect on improving students' communication skills. This is indicated by the F value of 83.487 with a significance of $p = 0.000$ and a Partial Eta Squared value of 0.416, which indicates that approximately 41.6% of the variation in the posttest scores can be explained by the collaborative learning treatment after controlling for the pretest scores. In addition, the pretest scores also had a significant effect on the posttest scores ($F = 6.232$, $p = 0.014$, Partial Eta Squared = 0.051), indicating that students' initial abilities also affect their final results..

These findings are in line with previous studies showing that collaborative learning can improve key aspects of communication, such as empathy, active listening, and negotiation. For example, a study by (Yusma et al., 2024) found that the use of technologies such as Socrative and smartphones in collaborative learning increased interactivity between students and teachers, as well as between students, which in turn improved student learning performance. Similarly, (Pulgar et al., 2022) reported that long-term collaboration with strong friendship ties can improve students' academic performance in distance and hybrid physics learning.

Furthermore, research by (Brundage et al., 2022) shows that peer interaction in learning can improve conceptual understanding through co-construction of knowledge. This shows that collaboration not only improves communication skills, but also students' conceptual understanding. In addition, (Schuster et al., 2021) found that students who have a central position in the collaboration network tend to have higher assignment and exam scores, indicating the importance of active involvement in collaboration for academic achievement..

Comparison with previous research:

collaborative learning significantly improves students' communication skills, including empathy, active listening, and negotiation. This finding is consistent with previous studies that highlight the effectiveness of collaborative approaches in developing communication skills. For example, (Hasandi et al., 2024) found that the Jigsaw learning method, as a form of cooperative learning, significantly improves the collaborative communication skills of fifth grade students of Madrasah Ibtidaiyah. Likewise, research by (Gulo et al., 2022) shows that the cooperative learning model can improve students' abilities in delivering negotiation texts .

Furthermore, research by (Utami et al., 2019) emphasized that there was a significant difference in the collaborative learning model assisted by mind maps on science learning outcomes before and after controlling for students' achievement motivation and academic achievement. Active discussions in groups allow students to share ideas, clarify understanding, and improve problem-solving skills. This shows that collaborative learning not only improves communication skills but also makes a positive contribution to students' academic achievement.

However, it is important to consider the context of collaborative learning implementation. (Afriadi & Fatih, 2024) identified challenges in implementing collaborative learning in higher education, such as imbalanced participation among group members and lack of facilitation skills from lecturers. Recommended strategies to address these challenges include more effective group management and facilitation training for lecturers. This suggests that the success of collaborative learning is highly dependent on effective management and support from educators.

The findings in this study are in line with previous literature that emphasizes the importance of collaborative learning in improving students' communication skills. However, the successful implementation of this approach requires attention to group dynamics and the role of the facilitator in creating a supportive learning environment. Therefore, collaborative learning strategies need to be designed by considering the context and specific needs of learners to achieve optimal results.

Thus, the results of the ANCOVA analysis in this study strengthen the evidence that collaborative learning is effective in improving students' communication skills. The implementation of learning strategies that encourage collaboration, such as group discussions and joint projects, can be an effective approach to developing students' communication skills. However, it is important to consider other factors that may affect the effectiveness of collaborative learning, such as group dynamics and the role of teachers in facilitating constructive interactions

Practical implications:

The implementation of collaborative learning in the education curriculum requires the active role of teachers as facilitators who are able to design and manage learning activities that encourage interaction between students. Teacher training is key to improving the pedagogical competencies needed to implement collaborative learning strategies effectively. For example, the collaborative learning approach in Sociology and Anthropology education has significant implications and benefits. This model also provides practical experience in applying sociological and anthropological concepts in real-world situations, and builds students who are ready to face complex future challenges. Despite challenges such as teacher training and access to technology, the development of this model responds

to changes in education, providing a strong foundation for relevant learning and deep understanding.(Damanaik, 2023)

In addition, teacher training at SMPN 2 Majene Regency showed that increasing teacher understanding and skills in implementing collaborative and participatory learning models can increase students' active participation in the learning process. This confirms that structured and ongoing training is essential to equip teachers with the strategies and techniques needed to implement collaborative learning..(Najamuddin et al., 2022)

In the context of the curriculum, the integration of collaborative learning requires adjustments that include the preparation of teaching materials, evaluation methods, and learning approaches that support collaboration between students. Teachers need to be trained to design learning activities that emphasize the development of communication skills, such as group discussions, collaborative projects, and joint presentations. Thus, teacher training that focuses on collaborative learning not only improves pedagogical competence, but also ensures that the curriculum implemented is able to develop students' communication skills effectively.

Conclusion

Based on the results of the analysis of covariance (ANCOVA) and the discussion conducted, it can be concluded that collaborative learning has a significant influence on improving students' communication skills, especially in the aspects of empathy, active listening, and negotiation. This effectiveness is indicated by statistical significance and a large partial eta squared value, which reflects the contribution of collaborative treatment to learning outcomes after controlling for the influence of initial abilities. This finding is consistent with various empirical studies in the last six years that affirm the positive contribution of a collaborative approach to students' academic outcomes and social skills. This confirms that collaborative learning is not only a pedagogical strategy, but also an important means of building 21st century skills.

Recommendation

In line with these findings, it is recommended that teachers actively integrate collaborative learning strategies into their daily teaching practices. Teachers need to be equipped with ongoing training that emphasizes not only theoretical aspects, but also practical applications and management of group dynamics in the classroom. In addition, curriculum development should be directed to provide more space for collaborative activities that facilitate communication skills between students. Educational institutions and policy makers need to ensure that teacher training includes collaborative approaches as core competencies, so that a more inclusive and participatory pedagogical transformation can be realized sustainably.

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