

EXPLORING THE IMPACT OF COLLABORATIVE LEARNING STYLE ON THE DEVELOPMENT OF CRITICAL THINKING IN THE SUBJECT OF ENGLISH AMONG SECONDARY SCHOOL STUDENTS

Gul Rukh^{*1}, Shafqat Ali²

^{*1}Ph. D. Scholar, Department of Education, Minhaj University, Lahore

²Professor, Department of Education, Minhaj University, Lahore

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Corresponding Author: *

Gul Rukh

Abstract

This study investigates how collaborative learning styles affect secondary school students' growth in English critical thinking. Utilizing an experimental design, the study examines data from 120 Grade 10 students in public schools in Lahore, Pakistan, to compare collaborative strategies with traditional teaching methods. Students' critical thinking skills were assessed on pre- and post-tests, and the experimental group exposed to collaborative learning showed statistically significant improvements. Although low achievers also benefited, high achievers showed the biggest improvement, demonstrating the inclusiveness of these tactics. Results confirm that collaborative learning improves academic performance, stimulates critical thinking, and encourages deeper cognitive engagement when it is matched with each student's unique learning style. The study recommends teacher training in collaborative methods and emphasizes the value of learner-centered, interactive approaches in secondary education. These observations support efforts to reform curricula in order to develop critical, reflective, and socially adept students who are prepared for the challenges of the twenty-first century.

INTRODUCTION

The development of critical thinking abilities has become a key component of both academic achievement and lifelong learning in modern education. Students who possess critical thinking skills are better able to navigate complex issues, make logical decisions, and participate meaningfully in civic and social life. Critical thinking is defined as the capacity to analyze, evaluate, and synthesize information in a logical and reflective manner (Facione, 2011). The importance of collaborative learning in developing these higher-order thinking skills is becoming increasingly apparent as global educational systems move away from rote memorization and toward learner-centered pedagogies (Johnson & Johnson, 2009). Collaborative learning promotes active participation, meaning

negotiation, and the creation of shared knowledge. It is generally defined as an instructional strategy in which students work in groups to accomplish shared academic objectives.

According to this framework, the dynamics and efficacy of collaborative learning environments can be greatly impacted by learning styles, which are the preferred ways in which people perceive and process information (Fleming & Baume, 2006). It has been discovered that incorporating collaborative learning while being mindful of different learning styles improves students' academic performance, motivation, and engagement (Kolb & Kolb, 2005). Students experience substantial cognitive, emotional, and social development during secondary school. As students move from concrete to more abstract and

evaluative reasoning, this stage is thought to be critical for the development of critical thinking (Piaget, 1972). As a result, the teaching methods used at this point must not only impart knowledge but also give students worthwhile chances to apply, challenge, and broaden their understanding through discussion and interaction.

Such an opportunity is provided by collaborative learning, especially when it promotes cooperative engagement and takes into account a variety of learning preferences (Slavin, 2014). In today's educational discourse, there is particular interest in the relationship between collaborative learning styles and critical thinking. Group work encourages deeper cognitive engagement and critical analysis when it is well-structured and inclusive of different learner profiles, according to studies. For example, students who are grouped according to their learning styles—visual, auditory, or kinesthetic—tend to enhance one another's strengths, resulting in more insightful conversations and better problem-solving outcomes. Additionally, the metacognitive processes that are necessary for critical thinking are stimulated by peer explanation and questioning, which are natural components of collaborative activities (Webb, 2009).

Despite this promise, little is known about how collaborative learning styles affect critical thinking in secondary school, especially in diverse learning environments. Fewer studies examine how the incorporation of particular learning styles in group settings affects the development of critical thinking skills, despite the fact that many studies support the general advantages of collaborative learning (Laal & Ghodsi, 2012). Furthermore, a large portion of the literature currently in publication concentrates on higher education, which leaves a knowledge vacuum regarding how these practices work in the more regimented and curriculum-bound setting of secondary schools.

Teaching strategies in many secondary school classrooms still primarily focus on individual assignments and standardized tests, leaving little opportunity for group projects or adjustment to different learning preferences (OECD, 2018). This conventional method frequently ignores the variety of student thought processes and impedes the growth of critical thinking, teamwork, and communication—all

of which are vital 21st-century abilities. Rethinking classroom procedures and investigating cutting-edge pedagogical strategies that are inclusive, participatory, and intellectually engaging are therefore urgently needed. One such innovation is collaborative learning styles. They entail matching group-based activities to each student's unique learning preferences in order to maximize cognitive and interpersonal interactions. For instance, a group consisting of kinesthetic, auditory, and visual learners can divide up the work in a way that challenges them to use various learning styles while also utilizing their individual strengths.

In addition to encouraging mutual respect and interdependence, this exposes students to a variety of thought processes, which is crucial for critical reasoning. More effective instructional design in secondary education can be informed by knowledge of how collaborative learning styles impact the development of critical thinking. With this information, educators can create meaningful groups, choose relevant assignments, and guide student interactions to encourage critical and analytical thinking. Insights into how collaborative pedagogies support national objectives of producing graduates who are reflective, creative, and socially adept can also be helpful to curriculum designers and educational policymakers.

Furthermore, because students from diverse cultural and linguistic backgrounds bring a range of prior knowledge, worldviews, and communication styles to the classroom, the significance of this research is amplified. Collaborative learning in these settings not only promotes academic development but also social integration and empathy, two traits that are becoming more and more important in a globalized world (Vygotsky, 1978; Gillies, 2004). Therefore, examining how collaborative learning styles can improve critical thinking can help create a more effective and inclusive educational system.

By methodically investigating how collaborative learning styles affect secondary school students' development of critical thinking, this study seeks to close a significant gap. It will look into whether particular learning style combinations in cooperative groups improve students' critical thinking, problem-solving, and reflective thinking abilities. Additionally, the study will investigate how students view teamwork and how their preferred methods of learning impact

their participation and output in group projects. This study's emphasis on secondary school environments will advance knowledge of successful teaching techniques that meet the developmental needs of teenage students. Additionally, it will have practical implications for teacher training programs that seek to prepare educators to manage diverse learner groups and for educators who want to promote critical thinking through classroom collaboration.

There is an increasing need for educational systems to use learner-centered and cognitively demanding teaching strategies in order to prepare students for the demands of the twenty-first century. When adapted to different learning styles, collaborative learning has a lot of potential in this area. In order to support secondary school students' academic achievement and lifelong learning, this study aims to offer empirical data and pedagogical insights into how these practices can be used to foster critical thinking abilities in them.

Literature Review

Background:

The modern educational environment requires students to develop higher-order thinking abilities like analysis, evaluation, problem-solving, and decision-making in addition to knowledge acquisition. Collaborative learning, which prioritizes interactive, group-based learning experiences, is one of the most popular teaching strategies for developing such abilities. Collaborative learning has even more potential to improve student outcomes when paired with an awareness of individual learning styles. The current research on learning styles, collaborative learning, critical thinking, and the interactions between these concepts is examined in this review of the literature, with a focus on secondary education.

Critical Thinking in Education

It is acknowledged that critical thinking is a basic educational objective that is necessary to equip students for the complexity of contemporary life. "Purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference" is how Facione (2011) defines critical thinking. Critical thinking requires both a set of cognitive abilities and the willingness to apply them successfully. Critical thinking in the classroom helps students to analyze information sources, approach problems

methodically, and consider how they reason. Since students at this level start to move from concrete operational thinking to more abstract and evaluative reasoning, critical thinking is crucial in secondary education (Piaget, 1972). As a result, instructional strategies need to actively encourage reflective, dialogic, and analytical learning experiences in addition to delivering content.

Strong critical thinking abilities help students deal with social situations, academic obstacles, and real-world decisions, according to research (Halpern, 2003). Reaching this objective is still difficult, though, especially in conventional classrooms where teacher-centered instruction and a heavy emphasis on recall-based assessments are used for assessment (Brookfield, 2012).

Collaborative Learning

The term "collaborative learning" describes teaching strategies that encourage interdependence, shared responsibility, and active participation by having students work in small groups to achieve common learning objectives. Collaborative learning facilitates more open-ended discussion and knowledge co-construction than cooperative learning, which is typically more structured. Effective collaborative learning is defined by five essential components, according to Johnson and Johnson (2009): (1) positive interdependence; (2) individual accountability; (3) face-to-face promotional interaction; (4) interpersonal and small group skills; and (5) group processing. When incorporated into the classroom, these components support students' deeper engagement with the material and the growth of their social and cognitive abilities.

According to Slavin's (2014) research, collaborative learning raises motivation, cultivates positive peer relationships, and improves student achievement. Collaborative assignments necessitate active participation, which gives students the chance to express their thoughts, defend their positions, and challenge presumptions—all essential components of critical thinking. Students who engaged in group learning outperformed those who learned alone on critical thinking assessments. In a similar vein, Webb (2009) highlights that in group projects, peer explanation and scaffolding aid students in elucidating their

comprehension and cultivating metacognitive awareness.

The preferred methods by which people take in, process, and remember information are referred to as learning styles. The VARK model divides students into four categories: visual, auditory, reading/writing, and kinesthetic (Fleming and Baume, 2006). These learning styles have an impact on students' performance in a variety of learning environments, peer interactions, and content engagement. According to Kolb and Kolb (2005), students are more likely to be engaged and retain information when learning experiences match their preferred learning styles. Teachers can establish balanced groups in collaborative settings that capitalize on each member's unique strengths by having a thorough understanding of learning styles. For instance, visual learners might use charts and diagrams to contribute, whereas auditory learners might lead discussions and provide oral explanations.

Underperformance and disengagement can result from a mismatch between teaching methods and learning preferences. Therefore, in order to maximize participation and learning outcomes, it is imperative that learning styles be incorporated into collaborative group composition. Crucial it is to honor each student's unique learning preferences in the classroom. They contend that disregarding learning preferences can make even the best-laid plans less successful.

Collaborative Learning Styles and Critical Thinking

The relationship between critical thinking, learning styles, and collaborative learning has been the subject of several studies. Even though each variable has been thoroughly examined separately, research on their combined effects is still in its infancy. According to Laal and Ghodsi (2012), because collaborative learning encourages students to express their reasoning, question one another's ideas, and synthesize various viewpoints, it naturally fosters the development of critical thinking. Students who bring a variety of learning styles to the table enhance these interactions even more. Collaborative tasks involving mixed-style learners (visual, auditory, and kinesthetic) produced more lively discussions and improved problem-solving results, according to a study by Zainuddin and Halili (2016). Heterogeneous learning

groups showed greater critical engagement than homogeneous ones, according to the researchers, indicating that a variety of cognitive approaches improves group reasoning.

According to a different study conducted in secondary schools in Nigeria by Aluko (2008), students who were given collaborative group projects that were customized to fit their learning preferences outperformed those in groups that were assigned at random on tests of critical thinking. The study underlined how crucial task design and group dynamics are to optimizing the advantages of cooperative learning. Furthermore, when students express themselves in ways that suit their preferred learning styles, peer feedback—a crucial part of collaborative learning—can have greater meaning. To help group members with varying learning styles grasp a concept more thoroughly, a kinesthetic learner might, for example, demonstrate it with a tangible model.

When it comes to creating and leading group learning activities that encourage critical thinking, teachers are essential. Gillies (2004) asserts that teachers' ability to scaffold group projects, keep an eye on interactions, and step in when needed is crucial to the success of collaborative learning. According to Brookhart (2010), educators need to set an example of critical thinking, pose open-ended questions, and foster an environment in the classroom where discussion and inquiry are valued. In order to create productive groups and assign roles that play to each student's strengths while also providing opportunities for growth, teachers must also be cognizant of the learning styles of their students.

After group activities, Webb (2009) found that teacher-led reflection and feedback greatly improve the development of critical thinking. In group projects, teachers also need to address common issues like uneven participation, student dominance, and shallow engagement.

To effectively manage diverse groups and use collaborative techniques, teachers must receive professional development (Johnson & Johnson, 2009). Collaborative learning may become distracted and not yield the intended cognitive results if it is not properly trained.

Secondary Schools and Collaborative Learning

Even though collaborative learning is strongly encouraged in higher education, there are particular difficulties when implementing it at the secondary level. Large class sizes, standardized testing pressures, and strict curriculum schedules frequently plague secondary classrooms, limiting opportunities for open-ended assignments and flexible grouping (OECD, 2018). However, studies show that well-structured collaborative learning has a substantial positive impact on secondary students. For example, a study by Gillies (2007) showed that secondary students in collaborative classrooms outperformed their peers in traditional settings in terms of academic performance, empathy, and reasoning abilities.

Malik and Malik (2011) discovered that collaborative strategies enhanced student motivation and achievement in English language classrooms in Pakistan. However, because some students were initially reluctant to speak or disagree openly in group settings, the authors also highlighted the importance of cultural sensitivity. One of the main challenges to successful implementation in secondary schools is language barriers (Farooq, 2012). Systemic support, such as curriculum redesign, teacher training, and the formal inclusion of critical thinking as a learning objective, is necessary to overcome these obstacles.

There are still a number of gaps in the extensive body of research on critical thinking and collaborative learning. First, there is little empirical data on how collaborative group composition and learning styles interact to affect the results of critical thinking. The majority of research views learning styles as a background variable rather than a crucial component of instructional design. Second, studies that concentrate exclusively on secondary school environments are scarce. Because of curricular and structural limitations, high school classrooms frequently lag behind universities in adopting collaborative learning. Third, not many studies use mixed-methods approaches, which combine qualitative group interaction observation with quantitative critical thinking assessment. To fully capture the intricacy of collaborative learning and its influence on cognitive development, such methods are required.

Objectives

1. To compare the effectiveness of traditional teaching methods and collaborative learning strategies on students' academic achievement in the English subject.
2. To investigate the impact of collaborative learning strategies on the development of critical thinking skills among high-achieving secondary school students.
3. To examine whether collaborative learning techniques significantly enhance the academic performance and critical thinking skills of low-achieving secondary school students in English.

Hypotheses

- H₀₁: There is no statistically significant difference in English academic performance between students taught through traditional teaching methods and those taught through collaborative learning strategies.
- H₀₂: Collaborative learning strategies do not significantly improve the academic performance and critical thinking skills of high-achieving secondary school students.
- H₀₃: Collaborative learning strategies do not significantly improve the academic performance and critical thinking skills of low-achieving secondary school students.

To give a thorough grasp of the research problem, this study will use an experimental design. To evaluate the development of critical thinking, the study will use a control group design with pre- and post-tests. Students in Grades 10th who were enrolled in public secondary schools in Lahore, Pakistan, make up the target population. Purposive sampling will be used to choose about 120 students from 10th grade. Four groups will be formed from the sample:

Group A: Collaborative learning style group

Group B: Control group (traditional instruction)

Test of Critical Thinking: To assess students' critical thinking in the following areas: inference, deduction, interpretation, and evaluation, an MCQs test of 60 items was developed and administered on both groups. An experimentation of collaborative learning environment was conducted for six weeks. Above mentioned test was administered on both groups before and after experimentation to collect data. The collected data was analyzed by using SPSS software,

and paired sample t-test was performed to assess the difference between pre-test and post-test results, while independent sample t-test was performed to see the

difference between control and experimental groups. The detail of data analysis and results is given in the tables below:

Table 1

Comparison of English Subject' Pre-Test and Post-Test Results of Students Taught Through Traditional Teaching Method (Control Group)

Test results	Participants	M. value	S. D.	p. value
Pre-test	40	11.761	1.873	.000
Post-test	40	18.981	3.945	

The pre-test and post-test results for students in the control group who received instruction using conventional method are shown in Table 1. To determine whether there was a statistically significant difference between the students' pre-test and post-test scores in the English subject, a paired samples t-test was used. The pre-test mean score was $M = 11.76$, SD

$= 1.87$, while the post-test mean score rose to $M = 18.98$, $SD = 3.95$. With a p value of .000 ($p < .05$), the results show a statistically significant improvement in scores. This implies that students' English performance improved over time as a result of traditional instruction.

Table 2

Comparison of English Subject' Pre-Test and Post-Test Results of Students Taught Through Collaborative Teaching Method (Experimental Group)

Test results	Participants	M. value	S. D.	p. value
Pre-test	40	12.289	2.391	.000
Post-test	40	26.811	4.563	

The pre-test and post-test results for the experimental group's students who received instruction through collaborative learning techniques are shown in Table 2. The impact of the collaborative teaching approach on students' academic performance and critical thinking in the English course was assessed using a paired samples t-test. The post-test mean rose considerably to $M = 26.81$, $SD = 4.56$, whereas the pre-test mean was $M = 12.29$, $SD = 2.39$. The statistical significance of the test score improvement is

indicated by the p-value of .000 ($p < .05$). This significant increase of roughly 14.52 points indicates that students' learning outcomes were significantly improved by the collaborative teaching approach, especially in terms of developing their critical thinking abilities. These results lend credence to the idea that group learning encourages deeper peer interaction and cognitive engagement, both of which are critical for the development of higher-order thinking abilities.

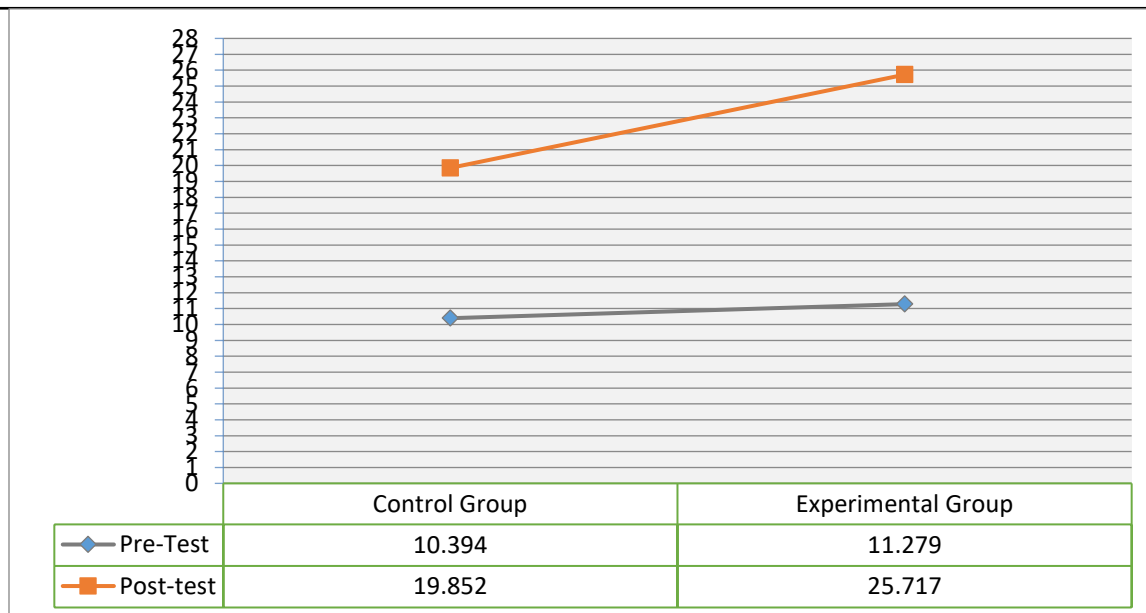


Figure I: Comparison of the pre- and post-test outcomes for the experimental and control groups

Table 3

Comparison of English Subject' Pre-Test and Post-Test Results of Low Achiever Students Taught Through Collaborative Teaching Method (Experimental Group)

Test results	Participants	M. value	S. D.	p. value
Pre-test	26	11.781	2.810	.000
Post-test	26	17.191	3.101	

The pre-test and post-test results for low-achieving students in the experimental group who received instruction through collaborative teaching techniques are shown in Table 3. To determine whether collaborative learning significantly impacted this subgroup's academic performance and critical thinking abilities, a paired samples t-test was used.

Low achievers had a mean score of $M = 11.78$, $SD = 2.81$ on the pre-test and $M = 17.19$, $SD = 3.10$ on the post-test. A statistically significant difference between the two sets of scores is indicated by the p-value of .000 ($p < .05$). This gain of roughly 5.41 points indicates that low-achieving students' academic performance in English was positively and statistically significantly

impacted by collaborative learning. The results demonstrate that collaborative strategies are effective in improving critical thinking skills, even among students with initially lower academic standing. It's possible that the collaborative learning environment gave these students more peer support, participation opportunities, and experiences that boosted their confidence, all of which helped them succeed academically. Even though low achievers saw a moderate improvement, the statistical significance of the gain demonstrates that collaborative teaching approaches are advantageous for students of all skill levels.

Table 4

Comparison of English Subject' Results from Pre- and Post-Test of High Achiever Students Taught Through Collaborative Teaching Method (Experimental Group)

Test results	Participants	M. value	S. D.	p. value
Pre-test	14	11.011	2.811	.000
Post-test	14	29.211	4.192	

The pre-test and post-test scores of high achievers in the experimental group—who were taught collaborative learning strategies—are shown in Table 4. To find out if the collaborative teaching strategy improved this subgroup's performance and critical thinking abilities, a paired samples t-test was used. High achievers had an average pre-test score of $M = 11.01$, $SD = 2.81$, which sharply rose to a post-test mean of $M = 29.21$, $SD = 4.19$. This improvement is

statistically significant, as indicated by the p-value of .000 ($p < .05$). The significant gain of roughly 18.20 points indicates that collaborative learning significantly influenced the academic performance and critical thinking development of high achiever students. High achievers in the collaborative learning environment showed the biggest improvement in test scores out of all the groups that were examined.

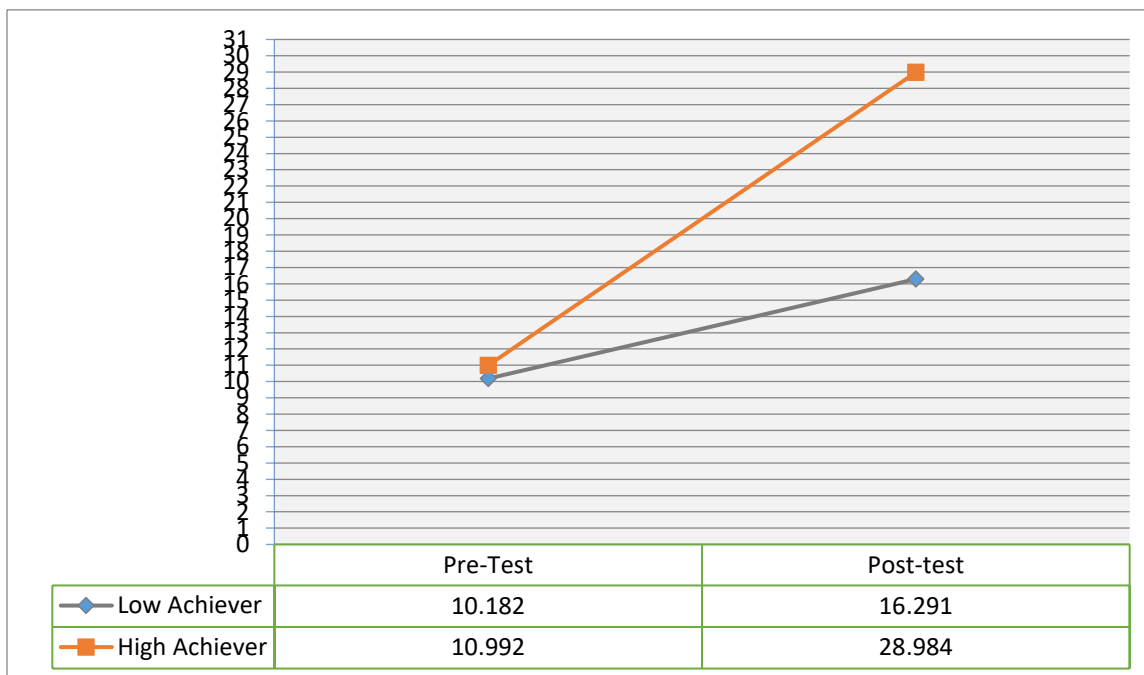


Figure II: Pre and post testing, low- and high-achieving students in the experimental group were compared.

Table 5

Comparison of Students' English Subject Results Taught Through Collaborative Teaching Method vs Taught Through Traditional Lecture Method

Comparison of Groups	Participants	M. value	S. D.	p. value
Control	40	18.104	4.292	.001
Experimental	40	26.220	4.188	

The post-test results for students in the experimental group (taught using collaborative teaching methods) and control group (taught using traditional lecture methods) in the English subject are compared in Table 5. To ascertain whether there was a statistically significant difference in student performance between the two instructional approaches, an independent samples t-test was used. After receiving traditional instruction, the control group ($n = 40$) obtained a

mean score of $M = 18.10$, $SD = 4.29$. The experimental group ($n = 40$), on the other hand, which was exposed to collaborative learning strategies, achieved a significantly higher mean score of $M = 26.22$, $SD = 4.19$. The two groups' performance differences are statistically significant ($p < .05$), as indicated by the p-value of .001. According to the findings, students who engaged in cooperative learning activities performed better than those who

received instruction using conventional lecture-based techniques. Students in the collaborative learning environment have a significant academic advantage, as evidenced by the mean difference of about 8.12

points. The enhanced opportunities for problem-solving, active participation, and peer interaction that come with collaborative teaching are responsible for this improvement.

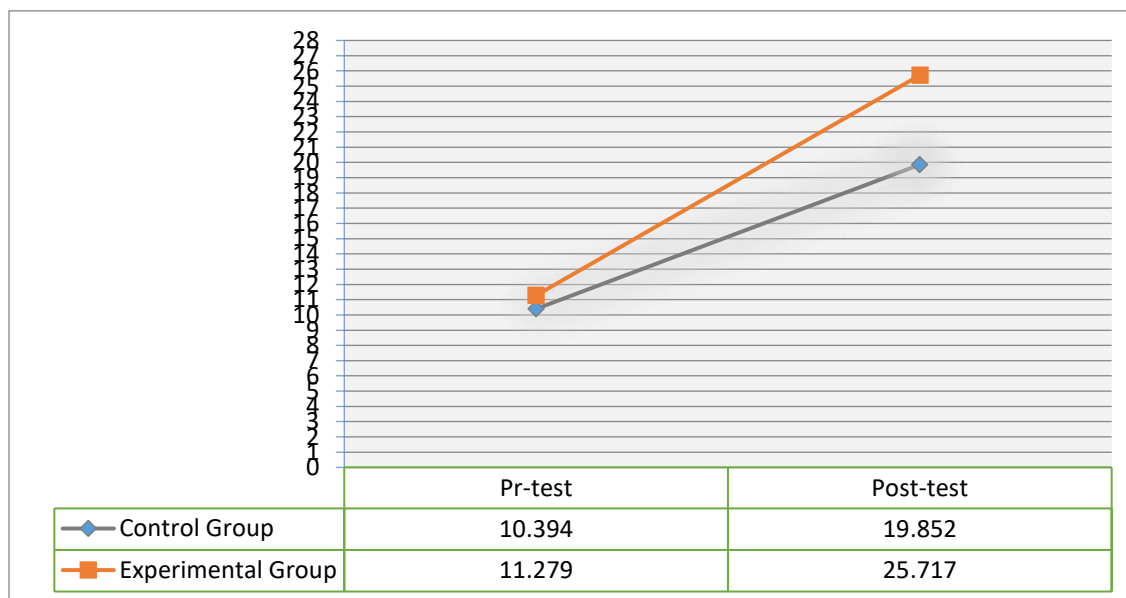


Figure III: Comparison of the pre- and post-test outcomes for the experimental and control groups

Discussion

This study looked into how secondary school students' collaborative learning styles affected their ability to think critically about the English language. Students who were taught using collaborative teaching methods (experimental group) and traditional lecture methods (control group) had their pre-test and post-test performance compared using a quasi-experimental design. The results of the analysis were also broken down by academic achievement levels, including high and low achievers.

Both the control and experimental groups showed statistically significant gains, according to the results; however, the experimental group's post-test performance improved significantly more. In particular, with a p-value of .001, students who were taught collaboratively performed noticeably better than those who were taught traditionally. This bolsters the body of research indicating that collaborative learning settings improve academic performance, encourage critical thinking, and foster deeper engagement (Gillies, 2022; Laal & Ghodsi, 2022). Collaboration has a transformative effect on cognitive outcomes, as evidenced by the experimental

group's post-test gains compared to their pre-test scores. These results align with Vygotsky's sociocultural theory, which highlights that social interaction and group problem-solving enhance learning (Kozulin et al., 2022).

The disaggregated analysis of high and low achievers within the experimental group was a noteworthy aspect of this study. The improvement was statistically significant for both subgroups, but it was disproportionately greater for high achievers (gain of 18.20 points) than for low achievers (gain of 5.41 points). This suggests that although all students gain from collaborative learning, high achievers might be better able to take advantage of the chances for higher-order thinking that these approaches present (Zhang et al., 2023). These findings are consistent with studies showing that students who perform better academically frequently take on leadership roles in group projects, which improves their capacity for metacognition and reasoning (Wang, 2023). The improvement seen among low achievers, however, is also positive and indicates that collaborative settings offer inclusive engagement for students whose

performance levels were initially lower (Sharan & Sharan, 2021; Vogel-Walcutt et al., 2021).

The notable performance improvements among students who participated in collaborative learning demonstrate its beneficial effects on the development of critical thinking. Peer discussions, group problem-solving, and reciprocal feedback are examples of activities that probably encouraged more in-depth thought and contemplation. This is in line with research by Terenzini et al. (2020), which found that student-centered learning strategies consistently outperform traditional lectures in terms of critical thinking outcomes. Collaborative approaches can greatly improve students' critical thinking and logical idea expression skills in the context of learning English, where interpretation, reasoning, and synthesis are essential (Lai, 2023; Facione, 2022).

Conclusion

The study concludes by showing that collaborative learning greatly outperforms traditional lecture-based instruction in fostering critical thinking and raising secondary school students' academic performance in English. In order to meet the cognitive needs of diverse learners and to prepare them for higher-order thinking challenges outside of the classroom, the results support the incorporation of collaborative strategies into regular classroom practice.

Recommendations

- ✓ Teachers should be trained and supported in implementing collaborative teaching techniques that engage students in the learning process. These techniques foster critical thinking, a crucial 21st-century skill.
- ✓ Emphasis needs to be placed on differentiated instruction in collaborative settings. High achievers gain a lot from collaboration, but low achievers might need more scaffolding, like defined roles, guided prompts, or teacher-facilitated peer support, to get the most out of it.

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