

Effectiveness of Collaborative Learning in Enhancing Critical Thinking Skills among Secondary School Students

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Abstract

The development of critical thinking skills has become an essential priority in modern education. The shift from traditional teacher-centered pedagogy to learner-centered approaches encourages educational researchers to examine methods that promote active thinking, reasoning, and problem solving. Collaborative learning, which emphasizes group interaction and shared responsibility in learning, has been increasingly recognized as an effective strategy to foster higher-order cognitive abilities. The present study investigates the effectiveness of collaborative learning activities in enhancing critical thinking skills among secondary school students. A quasi-experimental non-equivalent control group design was employed. Eighty students from two secondary schools were selected and divided into experimental and control groups. The experimental group underwent an eight-week collaborative learning intervention, while the control group received conventional instruction. Pre- and post-tests using a researcher-adapted Critical Thinking Test were administered. Data were analyzed using mean scores, standard deviation, and t-test statistics. Results revealed a significant improvement in the critical thinking performance of students exposed to collaborative learning, whereas the control group showed marginal, non-significant gains. The study highlights the importance of collaborative learning as a robust pedagogy for developing critical thinking skills and recommends that schools integrate collaborative activities into routine classroom instruction.

Keywords: Collaborative learning, Critical thinking, Secondary students, Pedagogy, Quasi-experimental design.

1. Introduction

The 21st century requires learners not only to acquire knowledge but also to analyze, evaluate, and apply it in real-life situations. In an information-driven world, where knowledge becomes obsolete rapidly, critical thinking has emerged as a central educational outcome. Employers, educators, and policymakers alike emphasize the importance of reasoning, innovation, logical decision-making, and the ability to examine issues from multiple perspectives. Therefore, educational systems must adopt instructional strategies that encourage deep learning rather than surface-level memorization.

Traditional teaching practices followed in many Indian classrooms remain predominantly teacher-centered, focusing on textbook reading, lecture-based instruction, and rote memorization. Although these methods may help in basic content recall, they often fail to engage students in reflective thinking, analytical questioning, or collaborative problem solving. As a result, students seldom get opportunities to justify ideas, challenge viewpoints, or evaluate the validity of information—skills which form the foundation of critical thinking.

Collaborative learning, an instructional strategy where students work in small groups to achieve shared academic goals, offers an alternative approach that is consistent with constructivist principles. In collaborative settings, learners engage in discussions, negotiate meaning, share experiences, raise questions, and collectively construct knowledge. These cognitive processes create rich environments for developing critical thinking skills. Research in Western and Asian contexts has shown that group interaction stimulates cognitive conflict, deepens understanding, and enhances reasoning abilities. However, in the Indian context, empirical studies on the relationship between collaborative learning and critical thinking, particularly at the secondary school level, remain limited.

This study aims to bridge this gap by examining whether structured collaborative learning activities can significantly improve the critical thinking abilities of secondary school students. By implementing a carefully designed collaborative learning module, this research investigates the pedagogical value of collaboration and demonstrates how it can contribute to meaningful learning in classrooms.

2. Review of Literature

2.1 Critical Thinking in Education

Critical thinking has been conceptualized by numerous scholars. Facione (1990) describes critical thinking as purposeful, self-regulatory judgment involving interpretation, analysis, evaluation, and inference. Ennis (1987) sees it as reflective and reasonable thinking that helps individuals decide what to believe or what to do. These definitions highlight the importance of reasoning, logic, and decision-making.

Halpern (1998) argues that critical thinking can be taught if learners are engaged in problem-solving, reflection, argumentation, and evaluation tasks. Schools must provide opportunities for learners to question assumptions, explore alternative solutions, and draw evidence-based conclusions. However, several studies show that regular classroom instruction does not sufficiently nurture higher-order skills unless specific teaching strategies are incorporated.

2.2 Collaborative Learning as an Instructional Approach

Collaborative learning rests on the belief that knowledge is socially constructed. According to Johnson and Johnson (1999), collaborative learning involves the positive interdependence of group members, face-to-face interaction, individual accountability, social skills, and group

processing. In collaborative classrooms, students depend on each other, exchange ideas, offer explanations, justify viewpoints, and refine their thinking.

Laal & Ghodsi (2012) reported that collaborative learning enhances communication skills, problem-solving ability, and peer relationships. It allows students to process information more deeply and consider varied perspectives. Moreover, group learning reduces classroom anxiety and encourages shy learners to participate.

2.3 Collaborative Learning and Critical Thinking

Collaborative learning has been found to foster cognitive conflict, which is essential for critical thinking. When students challenge each other's views, justify responses, and engage in arguments, critical reflection occurs. Gokhale (1995) found that students working collaboratively developed better critical thinking abilities than those working individually. Similarly, Abrami et al. (2004) observed that instructional interventions involving collaborative activities significantly improved critical thinking dispositions.

However, despite global evidence, research in Indian secondary schools is scarce. Many schools continue to rely on lecture-based teaching due to large class sizes, curriculum load, and exam-oriented learning. This study seeks to provide empirical evidence supporting collaborative learning as a potential solution for promoting critical thinking among Indian learners.

3. Need and Significance of the Study

Secondary school students often face an education system focused heavily on examinations rather than deep understanding. Developing critical thinking at this stage is crucial because adolescents form the basis for future academic and career decisions. Yet, limited opportunities exist for group discussion, peer learning, or analytical activities in typical classrooms.

This study is significant because:

- It investigates a modern teaching strategy that can replace rote learning.
- It highlights how collaborative learning can contribute to Nation Education Policy (NEP 2020) goals.
- It provides a practical model that teachers can adopt easily.
- It contributes to Indian educational research where empirical data on collaborative learning is limited.

4. Objectives of the Study

1. To assess the baseline critical thinking skills of secondary school students.
2. To develop and implement a collaborative learning module.

3. To compare the effectiveness of collaborative learning with traditional teaching methods in enhancing critical thinking skills.
4. To analyze the significance of differences between experimental and control groups after intervention.

5. Hypotheses

Null Hypothesis (H_0):

There is no significant difference between the mean post-test critical thinking scores of students taught through collaborative learning and those taught through traditional methods.

Alternative Hypothesis (H_1):

Students taught through collaborative learning will have significantly higher mean post-test critical thinking scores than those taught through traditional methods.

6. Methodology

6.1 Research Design

A quasi-experimental non-equivalent control group pre-test and post-test design was employed. This design allows comparison between intervention and non-intervention groups without random assignment.

6.2 Sample

Eighty students (40 in control and 40 in experimental group) were selected from two English-medium secondary schools in a semi-urban region. Students were from grade IX and aged 14–16.

6.3 Tools Used

a) Critical Thinking Test (CTT)

A researcher-adapted test based on the Watson-Glaser Critical Thinking Appraisal consisting of 40 items covering:

- Inference
- Assumptions
- Deductive reasoning
- Interpretation
- Evaluation of arguments

b) Collaborative Learning Module

The module, designed by the researcher, included:

- Group problem-solving tasks
- Peer teaching
- Debate and discussion activities
- Think–Pair–Share exercises
- Project-based group work

6.4 Intervention Process

The experimental group underwent an 8-week collaborative learning program. Activities included:

- Weekly group discussions on academic themes
- Group assignments requiring reasoning and decision making
- Peer feedback and reflection sessions
- Teacher as facilitator instead of lecturer

The control group followed regular chalk-and-talk traditional classroom teaching.

6.5 Data Analysis

Data were analyzed using:

- Mean
- Standard deviation
- Independent sample t-test

Level of significance was set at 0.05.

7. Results

Table 1: Pre-test and Post-test Scores

Group	Pre-test Mean	Post-test Mean	t-value	Significance
Experimental (n=40)	22.35	30.40	9.52	p < 0.001
Control (n=40)	22.58	24.10	2.10	p > 0.05

Interpretation:

- Both groups had similar pre-test scores, indicating homogeneity.

- After intervention, the experimental group showed a significant improvement.
- The control group's improvement was negligible and statistically insignificant.
- Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted.

8. Discussion

The findings clearly demonstrate that collaborative learning significantly enhances critical thinking skills among secondary school students. Students in the experimental group benefited from discussions, peer evaluations, and group problem-solving, which enabled them to think more deeply, analyze multiple viewpoints, and justify their reasoning.

The results align with prior studies by Gokhale (1995) and Abrami et al. (2004), which confirmed that collaborative environments stimulate cognitive development. The constructivist principle of learning through social interaction, as proposed by Vygotsky (1978), was reflected in the students' improved performance.

Traditional classes often emphasize note-taking and passive listening, which do not support critical thinking. In contrast, collaborative learning made students active participants, leading to deeper understanding and improved reasoning skills.

9. Conclusion

The study concludes that collaborative learning is an effective and powerful instructional strategy for enhancing critical thinking skills among secondary school students. Through structured group activities and peer interactions, learners develop analytical, evaluative, and reflective thinking abilities.

Teachers must shift from teacher-centered to learner-centered instruction to align with NEP 2020 recommendations. Schools should institutionalize collaborative learning across subjects to foster cognitive growth.

10. Educational Implications

1. Teachers should incorporate group tasks, peer discussions, and project-based learning.
2. Schools must provide training for teachers on collaborative pedagogies.
3. Assessment should move beyond rote learning to evaluate reasoning and critical thinking.
4. Curriculum designers should integrate collaborative activities systematically.
5. Collaborative learning can support inclusive classrooms by allowing multiple learning styles.

11. Limitations

1. Study limited to two schools; larger samples are needed.
2. Intervention conducted over eight weeks; long-term effects not assessed.
3. Only cognitive outcomes (critical thinking) measured; affective outcomes not included.

12. Recommendations for Future Research

1. Studies may explore collaborative learning across different subjects.
2. Comparative studies between rural and urban schools can be conducted.
3. Longitudinal research may measure sustainability of critical thinking gains.
4. Integration of digital collaborative learning tools can be explored.

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