

Fostering Creative and Critical Thinking Skills through Collaborative Learning: A Theoretical Approach

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Abstract

This study aims to improve students' creative and critical thinking skills by using a collaborative learning model. The problem studied is the low motivation of students to learn, students who are less creative and not critical, so a collaborative learning model is needed. The method used is qualitative with literature and literature studies, theoretically and historically analyzing the development of learning models. The results of this study consistently show that collaborative learning has a positive impact on the development of students' creative and critical thinking skills. Collaborative learning allows students to interact, share ideas and work together to achieve common learning goals. In this way, they can gain deeper understanding, solve problems creatively and develop their critical thinking skills. In other words, collaborative learning is an effective approach to improving students' thinking ability in various aspects. This study also explains the theoretical measurement factors for future researchers and describes, explains and measures the development of learning models based on theoretical studies.

Keyword: Collaborative Learning; Students' creative thinking skills; Collaborative Learning

1. Introduction

Creative and critical thinking skills are important aspects of students' cognitive and educational development. Creativity plays a role in problem-solving, innovation and deep understanding of concepts. One educational context that has been the focus of research is the influence of certain factors on students' creative thinking skills. Several previous studies have revealed that collaboration and various social factors play an important role in the development of students' creative thinking skills.

Numerous studies across diverse educational domains have been motivated by the recognition of the significance of creative and critical thinking skills in the teaching and learning processes. One particular focus of investigation has been the impact of collaborative learning approaches. In research conducted by (Malik et al., 2023), the Collaborative Creativity (CC) learning model demonstrated a favourable influence on students' creative thinking skills, specifically in the context of simple harmonic vibration material. The findings from this investigation suggest a noteworthy enhancement in the creative thinking abilities of students who engaged with this particular learning model.

In addition to learning method factors, social factors can also affect students' creative thinking skills, as revealed in a study by (Qureshi et al., 2023). They found that social factors, such as interactions with friends and teachers, as well as the use of social media, had a positive impact on collaborative learning and student engagement, which in turn contributed to improved student learning achievement. In addition, research (Loes, 2022) also highlighted the importance of collaborative learning in improving students' academic motivation. Regardless of other factors that may affect students' motivation, collaborative learning demonstrated a substantial and positive effect on the academic motivation levels of students.

On the examination of articles emphasizing collaborative learning's role in enhancing creative and critical thinking skills, particularly within the educational landscape of Indonesia. Employing the literature review method, the researchers analyze and condense findings from previously published research in scientific journals accredited by the Science and Technology Index (Rahman et al., 2022). The outcomes reveal the efficacy of the collaborative model in advancing both creative and critical thinking skills among students.

The findings from these studies suggest that factors such as collaborative learning methods and social interaction can have a positive impact on students' creative thinking abilities. Therefore, this study will further explore how these factors affect students' creative thinking ability in an educational context. This research will examine whether there are differences in students' responses based on gender as well as how social factors and collaborative learning methods can be used as alternatives in improving students' creative thinking abilities.

2. Literature Review

2.1 Collaborative Learning

Collaborative Learning is a learning model that involves cooperation between learners in the learning process. This model aims to improve learners' engagement, motivation, creativity and learning outcomes. Collaborative Learning is different from Cooperative Learning, which emphasizes structure and clear roles in learning groups. Collaborative Learning is more flexible and provides opportunities for learners to interact freely and help each other achieve shared learning goals. According to research (Alp & Bulunuz, 2023), The

integration of Collaborative Learning in science subjects has the potential to enhance students' grasp of concepts and foster critical thinking skills. As defined by (Loes, 2022), Collaborative Learning is an instructional approach that incorporates online technology to facilitate collaboration among students in the learning process.

2.2 Students' creative thinking skills

Creative thinking is the ability to think broadly, people with this ability to see and solve problems from various points of view and be able to create a solution with new ideas. Creative thinking is very close to a person's creativity in analyzing various things and becoming something new (Faatehah & Lestari, 2021). Creative thinking is a habit that is trained to reveal the possibilities of solving a problem. This is closely related to the creative aspect which is one of the goals of education (Achilov, 2017). Hence, enhancing the creative thinking skills of students is crucial. Various criteria can be employed to assess creative thinking, including the capacity for fluent thinking, the ability to generate diverse ideas when tackling problems, employing multiple approaches to problem-solving, utilizing systematic steps in addressing challenges, and employing a variety of methods in the problem-solving process.

(Jumadi et al., 2021) Examined the effect of collaborative learning on students' creative thinking skills, this research was conducted on students at Senior High School, East Lombok-Indonesia, involving 86 students of class XI IPA (age 15-16 years) who studied at SMAN 1 Aikmel, in this study, it was found that there was an effect of collaborative learning on students' creative thinking skills.

2.3 Students' critical thinking skills

Critical thinking is a kind of thinking in which you question, analyze, interpret, evaluate and make a judgement about what you read, hear, say, or write. (Permana et al., 2019) Critical thinking is a type of thinking in which you question, analyze, interpret, evaluate, and make judgments about what you read, hear, say, or write. Good critical thinking is about making reliable judgments based on reliable information. It is an important skill for students to develop as it enables them to analyze, evaluate, and solve complex problems and make informed decisions.

3. Material and Method

This research uses qualitative methods, qualitative research is a research method used to understand complex social phenomena in depth and detail. It involves the use of various methods such as interviews, observation, and documentation studies. Qualitative research helps in gaining a deeper understanding of phenomena, often focusing on the broad meanings, motives, aspirations, beliefs, values, and attitudes of individuals or groups (Aspers & Corte, 2019; Cissé & Rasmussen, 2022; Maxwell, 2021). Utilizing student surveys for data gathering, (Laisema & Wannapiroon, 2014) introduced a Collaborative Learning Process integrated with a Creative Problem-Solving Process, comprising five key stages: 1) task/problem identification, 2) project/work planning, 3) project/work creation, 4) project presentation, and 5) project evaluation. The collaborative model emerges as the widely adopted treatment, with tests and t-tests prevailing as the primary instruments for data collection and analysis in research (Timbrell et al., 2022). The application of these research findings serves to encourage educational

institutions to embrace collaborative learning models and provides valuable evaluation materials for stakeholders involved in collaborative learning implementations. To diversify the type of future research focusing on supporting creative and critical thinking skills based on insights is recommended by (Rahman et al., 2022).

Collaborative learning is an educational approach that emphasizes the use of groups to enhance learning through working together. Groups of two or more students work together to solve problems, complete tasks, or learn new concepts. This approach involves students actively processing and synthesizing information and concepts, rather than using rote memorization of facts and figures. Students work with each other on projects, where they must work together as a group to understand the concepts presented to them. By defending their positions, reformulating ideas, listening to other points of view and articulating their opinions, students will gain a more complete understanding as a group than they could as individuals.

Several theories support collaborative learning. One highly impactful theory is Vygotsky's social development theory, which posits that cognitive development is significantly influenced by social interactions. Vygotsky emphasized the essential role of social interaction in shaping cognitive growth. He argued that learning is a social process that occurs through interaction with others. Another theory is Piaget's cognitive development theory. Piaget believed that children construct their understanding of the world through experience and interaction with others. Finally, Kegan's Cognitive Development Theory states that people develop through a series of stages, each characterized by increasingly complex ways of thinking about themselves and the world around them.

Collaborative learning has been shown to have many benefits for students, including improved critical thinking skills, higher motivation, and better retention of information. There are many examples of collaborative learning activities that can be used in educational settings, such as group discussions, peer review sessions, and team projects.

3.1 Design Study

The participants were first informed about the study, and only after receiving their consent for the interview did we proceed with our questions. The interviews were conducted within the classroom. An attempt was made to maintain the spirit of the responses and not omit/change important information. We focused on selecting respondents who had used the collaborative learning model, the interview structure was initially allowed to flow freely, without a strict protocol to avoid imposing any theoretical framework on the respondents' thought processes.

The information collected in this research comprised responses from questionnaires, examinations, and interviews, completed by teachers, students, and vice principals, particularly in the academic curriculum domain. The research utilized several tools: (1) surveys to assess teachers' profiles regarding their classroom teaching methods, (2) test sheets designed to evaluate students' creative thinking abilities, and (3) interview sheets aimed at understanding teachers' approaches in the classroom. These instruments underwent validation for construction, content, and language by experts and were deemed suitable for implementation. The survey posed inquiries based on the ability to address problems using diverse problem-solving methods during classroom instruction. The collaborative learning model was applied with

appropriate syntax. The survey questions focused on whether students could successfully tackle problems using various solution methods during classroom learning. These instruments underwent thorough validation by experts in terms of construction, content, and language and were deemed suitable for use.

3.2 Data Analysis

Enhancing students' creative and critical thinking skills through Collaborative Learning involves the utilization of modelling techniques with the equation $CL = f(CS1, CS2, ML \dots)$, $ML = f(CS1, CS2 \dots)$ where CS1 = Creative Students CS2 = Critical Students, ML = Learning Motivation, CL = Collaborative Learning. Direct and indirect effects can be further analyzed in further research from the above modelling by following the statistical test criteria through confirmatory factor analysis and exploratory factor analysis tests on structural equation modelling.

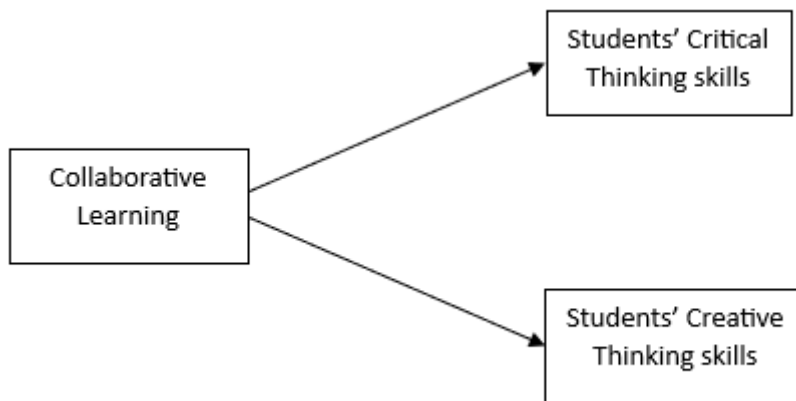


Figure 1. *Theoretical Framework*

4. Result

Collaborative learning, aimed at enhancing students' creative and critical thinking skills, was examined in this study employing a theoretical framework as outlined by (Rahman et al., 2022). The research specifically delved into the impact of the creative collaborative learning model (CC) on students' creative thinking abilities in the context of simple harmonic vibration material. The findings unequivocally demonstrate the positive influence of employing the creative collaborative learning model (CC) on students' creative thinking skills, with a notable increase observed. This study suggests that the CC learning model can serve as a viable alternative for enhancing students' creative thinking skills (Malik et al., 2023). Additionally, (Alp & Bulunuz, 2023) found that web-based collaborative learning utilizing Scratch software is effective in improving students' critical thinking skills. The results indicate that the group utilizing this method exhibited higher critical thinking skills compared to the group undergoing conventional learning approaches, suggesting a positive impact of integrating Scratch software into the learning process.

The influence of social factors on collaborative learning and student engagement (Qureshi et al., 2023), such as interaction with peers and the use of social media, has a positive influence on collaborative learning and student engagement. The results also show that collaborative learning and student engagement act as mediators in the relationship between social factors and student learning performance. This emphasizes the importance of using social factors in improving student learning. (Ariffin, 2021) Likewise, collaboration between students in developing vocabulary in learning is effective in improving understanding of speaking, listening, and reading skills, the results of this study show that the use of collaboration techniques in the classroom helps students feel more confident in interacting and participating in the learning process.

(Sirait & Amnie, 2023) Collaboration in teams helps students to share ideas, perspectives and knowledge. It creates an environment where creative thinking emerges, as students are inspired by the diverse viewpoints present in the group, Students' creative thinking ability is enhanced through the collaboration process, as they have to create innovative solutions together with their peers. (Rasyid & Khoirunnisa, 2021) Collaboration in learning projects spurs creative thinking, as students have to co-generate ideas and solutions for their projects. Creative thinking skills are enhanced in the collaboration process, as students stimulate each other to develop new ideas. (Hairida et al., 2021) Collaboration in project-based learning and inquiry encourages students to contribute to group discussions, work effectively in groups, and communicate in group activities.

(Lutfiah et al., 2021) Collaborative learning based on e-learning, namely the IBSC (Investigation Scientific Collaborative) learning model, on student creativity, can improve students' creative thinking skills. In addition, students' responses to this learning model are also positive. (Laisema & Wannapiroon, 2014) Collaborative learning uses the Creative Problem-Solving process in a holistic learning environment to develop creative thinking skills. Experts agree that this learning model is suitable for developing students' creative thinking skills.

According to (Permana et al., 2019), the most influential factor in enhancing students' critical thinking skills is their analytical ability. On a similar note, (Rahman et al., 2022) report that outcomes from diverse research studies consistently indicate the effectiveness of collaborative learning models in enhancing both creative and critical thinking skills among students. Specifically, collaborative models implemented across various subjects have proven to be successful in fostering improvements in students' creative and critical thinking abilities.

5. Discussion

In the realm of this research domain, numerous discoveries underscore the favourable effects of implementing collaborative learning models, particularly the Collaborative Creativity (CC) methodology, in enhancing students' cognitive abilities. Specifically, the positive outcomes of employing the Collaborative Creativity (CC) model demonstrate a noteworthy enhancement in the enhancement of students' creative thinking abilities, particularly in comprehending complex concepts such as simple harmonic vibration material, as evidenced in the study conducted by (Malik et al., 2023). The research demonstrates a substantial enhancement in the creative thinking capabilities of students who participate in this

learning model. Another pertinent study by (Qureshi et al., 2023) explores social factors within collaborative learning environments, revealing that interactions with peers, teachers, and the utilization of social media exert positive influences on collaborative learning and student engagement. This heightened engagement in the collaborative learning process contributes positively to overall student learning outcomes.

Research has also highlighted the effect of collaborative learning on students' critical thinking abilities (Warsah et al., 2021). There is evidence that web-based collaborative learning using software such as Scratch can improve students' critical thinking skills. The results showed that the group using this method had higher critical thinking skills than the group following the conventional learning method. Other research, as described by (Sirait & Amnie, 2023), emphasizes that collaboration in groups helps students share ideas, views, and knowledge. This creates an environment where creative thinking ability emerges, as students are inspired by the diverse viewpoints in the group. Students' creative thinking ability is enhanced through the collaboration process, where they have to create innovative solutions together with their peers.

Implementing a collaborative learning approach has the potential to cultivate both creative and critical thinking skills in learners. This method enables students to adeptly address problems using swift and precise strategies, incorporating a blend of critical thinking and logic. It discourages the tendency to rely solely on logic, hastily recording final results without a systematic problem-solving approach and accurate understanding of concepts. The utilization of a collaborative and open learning model serves as a platform for students to develop systematic problem-solving abilities, as well as enhance literacy and numeracy skills. Furthermore, this approach fosters a deeper comprehension of the discussed subject matter. When students possess proficient creative thinking skills, it streamlines the learning process, aiding in the comprehension of challenging problems. Consequently, this facilitates the exchange of knowledge and promotes effective learning.

6. Conclusion, Implication, and Recommendation

The research findings discussed in this study provide valuable insights into the positive impact of collaborative learning, on students' creative and critical thinking skills. The findings suggest that collaborative learning methods play an important role in improving students' cognitive abilities. Some important points and implications can be drawn from this research: (1) Collaborative learning fosters students' ability to think broadly, generate innovative solutions, and approach problems from multiple perspectives. (2) Social factors, including interactions with peers, teachers, and the use of social media, have been shown to positively influence collaborative learning and student engagement. (3) Collaborative learning can significantly affect students' critical thinking skills. (4) Collaboration in group settings fosters an environment where diverse viewpoints are shared. Students are inspired by these diverse perspectives, which in turn enhances their creative thinking ability.

In conclusion, this study supports the proposition that collaborative learning significantly contributes to the development of students' creative and critical thinking skills. By promoting a dynamic learning environment where students engage with peers, exchange ideas, and work collectively to solve problems, collaborative learning equips students with valuable skills that

transcend traditional classroom settings. These skills are essential for problem-solving, innovation, and a deeper understanding of academic concepts. Therefore, educators and institutions should continue to explore and implement collaborative learning strategies to foster students' intellectual growth.

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