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Effectiveness of Collaborative Learning in the Educational Process

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Abstract: *This study investigates how modern strategies, particularly the application of cooperative learning, influence children's motivation, communication skills, and self-esteem. The first part presents a theoretical overview of collaborative learning, drawing on models and theories from the literature. The second part outlines the research methodology, which involved 25 primary school pupils of similar ages. Pearson correlations and t-tests for both paired and independent samples were employed to analyse the results. The findings indicate that students who engaged in more cooperative learning activities exhibited higher levels of motivation, self-esteem, and more effective communication skills compared to those who participated solely in traditional face-to-face activities. Consequently, it is recommended that pupils be involved in as many cooperative activities as possible.*

Keywords: *effectiveness; collaborative learning; educational process.*

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Introduction

Over time, education has developed and transmitted a variety of didactic strategies that continue to evolve. When we refer to "teaching strategies," we encompass a broad range of methods, teaching aids, and organisational forms used in lessons or educational activities. Mastery in selecting the most effective methods, teaching materials, and organisational forms by educators is crucial for student success. Why choose cooperative learning? This method values and emphasises the educational ideal. The educational ideal of the Romanian school aims for the free, comprehensive, and harmonious development of human individuality, fostering the formation of autonomous personalities and the adoption of a value system essential for personal fulfilment, entrepreneurial spirit, active citizenship, social inclusion, and employability (Clipa & Juravle, 2017). Although the educational ideal has undergone minor changes over time, it continues to reflect the same core principle: preparing students for social integration (Al-Rahmi & Zeki, 2017).

Learning experiences gained in classroom activities are among the most significant moments in shaping students' personalities. Collaborative or cooperative learning is a concept frequently employed in education, involving the collaboration of two or more individuals towards a common goal. This paper reviews the relevance of cooperative learning models in primary education while also exploring the role of competition in learning (Anastasiades et al., 2008; Fizi et al., 2023). Data were collected from both students and teachers. The results confirm that students displayed a more open attitude towards group work and were more selective regarding competition. The study also reveals that group integration is readily achieved by students, and their mood is more likely to shift from negative to positive (Mänty et al., 2020).

Recently, the significance of affective mental processes and emotions in learning has gained increasing attention. Emotions play a crucial role in academic learning, influencing students' motivation and performance (Tyng et al., 2017). Cooperative learning, despite its seemingly simple nature, has attracted considerable interest from researchers, leading to its examination from various perspectives: psychological, disciplinary, and digital (Clipa et al., 2023; Mendelova & Guzikova, 2024). Given the time students have spent in online environments, teachers have faced significant challenges in facilitating

teamwork in this format (Keser & Özdamli, 2012). Therefore, it is essential to consider societal requirements. This learning approach is integrated into teaching from the preparatory class onwards, aiming to cultivate as many skills as possible in children. A vital aspect of this approach is that participation in team activities fosters interpersonal intelligence.

This study aims to capitalise on the effectiveness of cooperative learning in the educational process, specifically in primary education. The traditional structure of teamwork has been supplanted by collaborative learning. In the specialised literature, these two groups are referred to as learning groups—cooperative groups and traditional learning groups (Johnson et al., 1993). Although this may seem like a mere play on words, the two structures differ significantly in several aspects.

For instance, in cooperative learning groups, there is positive interdependence among members, individual responsibility is embraced, the group composition is heterogeneous, joint decisions are made, and both the relationships among members and the tasks to be accomplished are valued. The teacher can intervene at any time, and the process concludes with feedback (Van Leeuwen & Janssen, 2019). In contrast, traditional learning groups lack interdependence, do not assume individual responsibility, are homogeneous, appoint a leader, do not hold students accountable for their peers' mistakes, focus solely on tasks, and the teacher remains uninvolved, with no assessment of the group's functioning at the end.

These components were developed by Johnson et al. (1993). Numerous studies have been conducted on group work, both traditional and modern, prompting me to undertake comparative research to examine what to look for in such a method and how to apply it effectively. Thus, the primary question of this research is: Does cooperative learning enhance the educational process? An important consideration is the perceptions of both teachers and parents regarding the application of this method (Anastasiades et al., 2008). Based on previously formulated concepts and ideas from researchers and prior studies, the purpose of this study is to analyse the possibilities of implementing cooperative learning in primary education.

At the conclusion of this study, the results obtained will have practical and pedagogical implications, providing valuable insights for teachers and parents.

Collaborative Learning - Definition and Characteristics

Educational sciences have shown a growing interest in the implementation and application of modern methods in the classroom. Communication, interactivity, fostering positive emotions, motivating students, and enhancing sociability are just a few of the skills that students are eager to develop (Pateşan et al., 2016). One of the modern strategies that can help students cultivate these skills is cooperative learning.

Collaborative learning as a pedagogical approach, prepares students to work collaboratively with others. This type of learning aims to achieve several objectives, such as cultivating responsibility not only for one's own learning but also for the achievements of other group members, assuming roles within the group, and overcoming emotional barriers. Collaborative learning is a complex process that involves the development of both cognitive and affective processes (Johnson et al., 1993), who identified several differences between traditional and modern teaching. These differences were noted in the methods used for information transmission, the roles of students and the school, the informational base of the teaching staff, and the nature of relationships among students. In summary, modern teaching aims to guide students to discover information independently, with learners actively involved in the educational process, becoming aware of the knowledge they possess, and fostering essential interaction between teachers and students, while the school plays a role in developing students' potential (Clipa & Juravle, 2017).

The concept I aim to research is supported by several theories, including the theory of social interdependence, behaviourist theories, cognitive theories, and theories on the collaborative construction of knowledge using new technologies. The first theory, as presented in the title, focuses on interdependence. According to Laal (2013), one of the proponents of this theory, the type of interdependence established at a given time will determine how group members interact. The three types of interaction proposed by this author are:

1. The positive interdependence posits that one person's success can also lead to the success of others. Any success benefits all group members, while any failure disadvantages everyone. This type of interdependence encourages cooperation.
2. Negative interdependence - centres on the idea that one person's failure affects the success of other members, and conversely, one

person's success can hinder the success of others. This type of interdependence fosters competition.

3. Lack of interdependence - has no effect on the success or failure of a person.

   This situation is typical of individual activities.

The increasing volume of information and the enrolment of more children in schools have necessitated the integration of technology into education. With the introduction of devices such as computers, phones, and the internet, teachers have gradually moved away from traditional methods and adapted to the new demands of students through modern methods, one of which is cooperative learning. Technology in education presents both advantages and disadvantages (Keser & Özdamli, 2012).

Among the advantages, we can highlight that geographically distant individuals can exchange information and collaborate using various platforms. Furthermore, technology facilitates the creation of a constructivist learning environment that promotes self-learning (Keser & Özdamli, 2012). The use of technology in educational settings is one limitation of the most engaging topics to explore today.

In addition to the myriad experiences and information it provides, technology is closely linked to motivation. In a study of active collaborative learning exercises, researchers claimed that the social environment positively impacts students, enabling them to engage in activities such as written discussions with peers and facilitating immediate feedback. Researchers argue that collaborative learning is particularly significant when learners possess cognitive skills (Al-Rahmi & Zeki, 2017).

Motivation refers to the cognitive and emotional states and processes that can trigger, support, and guide various activities and behaviours. Before motivating students, teachers must themselves be highly motivated. Therefore, it is essential for educators to understand the meaning of collaborative learning, to have experienced it themselves, and to help students recognise that participation in such activities can enhance their mood, increase motivation, and open them to new experiences. Psychological studies demonstrate a close relationship between motivation and academic performance. Consequently, school successes are attributed to the degree of motivation and engagement in learning. A direct proportional relationship exists between these two concepts: as motivation intensifies, performance levels increase.

In a study conducted on children aged 9 to 12, as well as on those aged 12 to 15, examined the effects of collaborative, competitive, and individualistic teaching methods on student performance. The findings revealed that cooperation consistently led to higher results and increased motivation. This study also associated with more positive perceptions of other members of the class, including those from different ethnic backgrounds and individuals with disabilities. In this study, it was found that cooperation consistently led to higher results and greater motivation. It was also highlighted that collaborative learning was associated with more positive perceptions of classmates, including those from different ethnic groups and people with disabilities (Tolmie et al., 2010).

We can examine this concept from two perspectives: traditional and modern. From a traditional perspective, collaborative learning involves group work without competition, while from a modern perspective, it envisions the collaboration of all participants in achieving common goals. Cooperative learning supports the harmonious development of students' biopsychosocial characteristics, contributes to the formation of autonomy, and fosters communication, social skills, adaptability, attention, critical thinking, and positive attitudes. Compared to competition, this new concept fosters a sense of belonging to a group.

Many students possess skills for working in groups but struggle with communication or adapting to new environments. This learning method enhances cognitive and affective mental processes and provides students with more opportunities for development. Moreover, to cooperate means to work together with others, while to compete focuses on achieving a desired outcome without regard for the collaborative process, as seen in cooperation. The study also presents some methods that support and standardise cooperative learning, including the gallery tour, the mosaic, and the round table. This study confirms that collaborative learning is more effective than competition. This conclusion is supported by the fact that cooperative learning situations positively motivate students, enhance their self-esteem, improve their social skills, and promote the exchange of ideas among students.

Collaborative learning shapes and develops the personalities of all students involved in the educational process. In active learning, the role of students changes significantly as they must take responsibility for their own learning. Active learning encourages and stimulates the development of critical thinking by adopting real-life and hypothetical

situations. Students cultivate personal skills and a positive attitude towards learning. One of the concepts of active learning is collaborative learning, which aims to reduce feelings of individual isolation. By interacting and communicating within formed groups, students develop a sense of belonging (Mandusic & Blaskovic, 2015).

Thus, some of the most significant figures in students' lives are their teachers. To educate is to inspire hope for the future, to sow wisdom, and to reap with patience. To educate is to seek the treasures of the heart. The role of teachers in society and in schools is to train rather than merely inform. The education of emotions and the development of essential functions of intelligence—such as the appreciation of beauty, the ability to articulate ideas, and the entrepreneurial spirit—are more critical than the mere presentation of information. In conclusion, collaborative learning fosters numerous qualities in students, enhances their communication skills, shapes their character, creates a supportive school environment, and prepares them to face the challenges of daily life. Education will always play a vital role in society and will remain the only flower that does not wither, regardless of the era.

Research Design

Collaborative learning is one of the teaching strategies that consider the development of students' complex mental processes. Additionally, in group interactions, the socio-emotional experiences of group members and their interpretations of these interactions shape the unique group dynamics and situational motivation during group learning. The objectives of this study focus on examining the level of motivation before engaging in cooperative or traditional learning activities. It also explores how students' communication skills change after participating in these two types of activities, as well as their self-esteem levels. Consequently, this scientific article aims to investigate the following hypotheses:

Hypothesis 1: There is a significant correlation between students' self-esteem and communication anxiety following a traditional learning activity.

Hypothesis 2: There are gender differences in the level of communication anxiety after a traditional activity.

Hypothesis 3: Students' self-esteem correlates significantly with their motivation following a traditional learning activity.

Hypothesis 4: There are gender differences in student motivation following a traditional learning activity.
Hypothesis 5: There is a significant correlation between students' motivation and communication anxiety following a collaborative learning activity.
Hypothesis 6: There are significant differences between students' motivation levels after a collaborative learning activity and after a traditional activity, such that students exhibit a higher level of motivation following the former.
Hypothesis 7: The level of students' self-esteem is higher after a cooperative learning activity compared to their self-esteem after a traditional learning activity.

Presentation of the Plot and Procedure

The subjects of this study were 25 students from a rural school, aged between 8 and 10 years. All participants were second-grade classmates. The subjects participated in two different activities:

- Traditional activity
- Collaborative learning activity

After each activity, they completed a questionnaire with identical items. In addition to the two questionnaires, consent forms were provided to both the parents and the students, allowing them to express their agreement to participate in the study. Furthermore, the students were informed about the study's purpose and provided with a description. Participants were assured that their involvement was voluntary and that the information obtained would be used solely for academic purposes, ensuring the transparency of their responses.

Descriptive Statistics. Demographic Data

The subjects are students from a rural school, aged between 8 and 10 years. There are 25 students, all from the same region of Romania, and they are second-grade students from the same school. Of these, 12 are boys (44%) and 13 are girls (56%). Regarding the students' ages, 84% are 9 years old, 12% are 8 years old, and 4% are 10 years old.

Data Collection Tools

For this research, the following validated data collection tools were employed:

- Communication Anxiety Inventory - this inventory comprises 20 items that assess the emotions and states experienced by students after a traditional or cooperative learning activity. To validate the responses, a Likert scale from 1 to 5 was used, where 1 = Not at all true, and 5 = Very true (Booth-Butterfield & Gould, 1986).
- Self-Esteem Questionnaire - this questionnaire includes 10 items that analyse the student's relationship with the type of activity. Study subjects were tasked with rating their responses on a four-point Likert scale (1 = strongly disagree, 5 = strongly agree) (Pierce et al., 1989).
- Motivation Level Questionnaire - this questionnaire consists of 7 statements. Students are required to rate how true these statements are for them on a Likert scale from 1 to 4, where 1 = Not at all true and 4 = Very true.

Descriptive Statistics

After collecting all data related to the modern didactic strategy of cooperative learning and after the students completed all questionnaires, we used the Jamovi program to enter the data and perform the analysis.

Results

Hypothesis 1: There is a significant correlation between students' self-esteem and communication anxiety following a traditional learning activity.

To assess whether there is a significant positive correlation between students' self-esteem and communication anxiety after a traditional activity, we performed a Pearson correlation analysis in Jamovi. The resulting data indicated a significant negative correlation between the two variables: ($r = -0.826$, $N = 25$, $p < .001$). The effect size is medium to large, indicating a strong coefficient. Students' self-esteem improves due to positive relationships with peers, thereby reducing communication anxiety (Tedesco, 1999). This hypothesis is confirmed.

Correlation matrix			
		Self-esteem after traditional activity	**Communication anxiety following a traditional learning activity**
Self-esteem after traditional activity	**Pearson^s r**	-	-0,826
Communication anxiety following a traditional learning activity	**df**	-	23
	p-value	-	p < .001

Table 1. Correlation between students' self-esteem and communication anxiety following a traditional learning activity

Hypothesis 2: There are gender differences in the level of communication anxiety following a traditional activity.

To determine whether there is a significant difference between boys and girls regarding communication anxiety after a cooperative learning activity, we employed an independent samples T-test in Jamovi. The resulting data indicated significant differences between the two genders. The male group recorded values of (N = 12; M = 62.6; SD = 10.2), while the female group recorded values of (N = 13; M = 70.3; SD = 8.15). In other words, gender influences communication anxiety, with girls exhibiting higher values compared to boys. This hypothesis is confirmed.

Group Descriptive						
Communication Anxiety	**Group**	**N**	**Mean**	**Median**	**SD**	**SE**
	Female	13	70.3	73	8.15	2.26
	Male	12	62.6	62	10.2	2.94

Table 2. Independent samples t-test results for the relationship between gender and communication anxiety

Hypothesis 3: Students' self-esteem correlates significantly with their motivation following a traditional learning activity.

To assess whether there is a significant positive correlation between students' self-esteem and the motivation after a traditional

activity, we conducted a Pearson correlation analysis in Jamovi. The resulting data indicated that there is a significant negative correlation between the two variables: ($r = 0.703$, $N = 25$, $p < .001$). In other words, higher self-esteem corresponds with higher student motivation. The effect size is medium. This type of learning, due to the processes involved and the collaborative nature of the activity, brings numerous benefits, as collaboration enhances both self-esteem and motivation. This hypothesis is confirmed.

Correlation matrix			
		Self-esteem after traditional activity	**Motivation after traditional activity**
Self-esteem after traditional activity	**Pearson^s r**	-	0,703
Motivation after traditional activity	**df**	-	23
	p-value	-	p < .001

Table 3. Self-esteem correlates significantly with their motivation following a traditional learning activity.

Hypothesis 4: There are gender differences in student motivation after a traditional learning activity.

To assess whether there is a difference between boys and girls in terms of student motivation after a traditional activity, we used an independent samples T-test in Jamovi. The resulting data indicated that there were significant differences between boys and girls. For the male group, the following results were obtained ($N = 11$, $M = 26$, $SD = 5.02$), while for the female group, the following values were recorded ($N = 14$, $M = 23.8$, $SD = 5.02$). Regarding this hypothesis, we conclude that after a traditional activity, girls exhibit a higher level of motivation compared to boys. This hypothesis is confirmed.

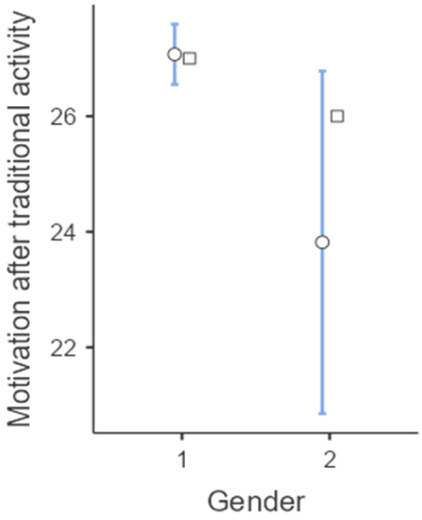


Chart 1. Gender mapping of students' motivation after a collaborative learning activity.

Hypothesis 5: There is a significant correlation between students' motivation and communication anxiety following a cooperative activity.

To assess whether there is a significant negative correlation between students' communication anxiety and motivation after a cooperative learning activity, we performed a Pearson correlation analysis in Jamovi. The resulting data indicated that there is a significant negative correlation between the two variables: (r = -0,682., N = 25, p < .001). The effect size is medium. This hypothesis is confirmed.

Correlation matrix			
		Communication anxiety after cooperative learning	**Motivation after cooperative learning**
Communication anxiety after cooperative learning	**Pearson^s r**	-	-0,682
Motivation after cooperative learning	**df**	-	23
	p-value	-	p < .001

Table 4. Correlation between students' motivation and communication anxiety following a cooperative activity

Hypothesis 6: There are significant differences between the students' motivation levels after a collaborative learning activity and after a traditional activity, with students registering a higher level of motivation following the former.

To verify whether there are significant differences between the students' motivation levels after a cooperative learning activity and after a traditional activity, we employed a paired samples T-test using the Jamovi program. The resulting data indicated that there is a significant difference between the two variables, with the coefficient p recording a value of $< .001$. Additionally, the table below indicates that the motivation level levels after a collaborative learning activity ($M = 25.6$) is significantly higher than the motivation level of motivation after a traditional activity ($M = 12.1$). This hypothesis is confirmed.

Descriptive					
	N	**Mean**	**Median**	**SD**	**SE**
Motivation after Collaborative Learning	25	25.6	27.0	3.71	0.741
Motivation after Traditional Activity	25	12.1	12.0	4.23	0.846

Table 5. Motivation after a collaborative learning activity and after a traditional learning activity

Hypothesis 7: The level of students' self-esteem is higher after a collaborative learning activity compared to their self-esteem after a traditional learning activity.

To assess whether there is a significant difference between students' self-esteem levels after a cooperative learning activity and after a traditional activity, we employed a paired samples T-test. The resulting data indicated significant differences between the two situations. In the first situation, the following values were recorded ($N = 25$; $M = 20.6$; $SD = 6.17$), while for the second situation, the values were ($N = 25$; $M = 23.4$; $SD = 5.85$). In other words, the type of activity in which students participate influences their motivation, with cooperative learning leading to higher self-esteem compared to traditional activities. This hypothesis is confirmed.

Descriptive			
	N	**Mean**	**SD**
Self-Esteem after Collaborative Learning	25	20.6	6.17
Self-Esteem after Traditional Activity	25	23.4	5.85

Table 6. Students' self-esteem after a collaborative learning activity and after a traditional learning activity

Discussions. Strengths and Limitations of the research

The primary aim of this research was to highlight that the didactic strategy of cooperative learning is a crucial element in the training and development of students, yielding positive effects on their mental processes.

Studies conducted on this topic convey the message that the regular application of cooperative teaching strategies enhances students' self-esteem and their motivation. Additionally, this study urges all educators to embrace teaching strategies beyond traditional, competitive, or individualistic approaches.

The online administration of the questionnaire following the conducted activities is one of this study. Conversely, the approximately equal number of male and female subjects is strength, as is the interpretation of the data using the Jamovi program, which provides accurate and precise results. Exploring the relationship between cooperative learning and other mental processes or learning methods could yield interesting insights for the field of education. Expanding the study to include a larger sample, encompassing students from different regions of the country and various backgrounds, would facilitate the acquisition of more accurate data that could later be generalised at a macro level.

Seven hypotheses were formulated in this research. The first hypothesis considers the variables of emotional stability and communication anxiety. Specialized studies confirm that interaction among students encourages them to engage, leading to increased self-esteem and reduced communication anxiety (Muijs, 2015).

The second hypothesis was analysed using the T-test for independent samples, considering gender and the level of communication anxiety following a traditional activity. The results

indicate that boys exhibit higher values, suggesting that they experience greater communication anxiety. This finding is supported by Corcevoi (2020), who argues that anxiety is a significant factor contributing to school failure.

The third hypothesis focused on the relationship between self-esteem and motivation levels after a cooperative learning activity. We can conclude that high self-esteem supports student motivation, and conversely, self-esteem increases alongside student motivation. According to Purcaru & Maximciuc (2021), the more positive a student's self-perception, the easier it is for them to engage in activities and find motivation.

The fourth hypothesis examines gender differences in communication anxiety after a cooperative learning activity. This hypothesis is supported by Laal (2013), who demonstrated that both girls and boys are susceptible to communication anxiety.

The fifth hypothesis again targets gender, this time focusing on student motivation. The teaching style of the educator and the employed didactic strategies can positively or negatively influence student motivation (Morgan et al., 2005).

This research also includes a hypothesis positing significant differences in student motivation of students after a cooperative learning activity compared to a traditional activity, with students demonstrating higher intrinsic motivation compared to the former. After completing a motivation questionnaire consisting of 27 questions and analysing the results, it was found that students exhibited significantly higher levels of intrinsic motivation after cooperative learning compared to competitive activities.

The final hypothesis analysed whether students' self-esteem is higher after a cooperative learning activity compared to their self-esteem following a traditional learning activity.

The organisation of lessons not only influences students' self-esteem but also their performance (Johnson et al., 1993).

Conclusions

This paper begins with an analysis of the specialised literature addressing concepts related to the theme (cooperation, group dynamics, forms of organisation, anxiety, motivation, communication). The proposed hypotheses align with findings in the specialised literature. Communication anxiety, student motivation, and self-esteem are among

the most significant factors influencing changes in student behaviour, depending on the type of activity conducted: traditional or group-based. The atmosphere created, the communication, and the relationships established in the classroom significantly influence students, leading them to adopt either an engaged or disengaged attitude towards the assigned tasks. Thus, cooperative learning provides students with greater freedom and fosters harmonious development.

The results obtained serve to guide educators towards placing greater emphasis on cooperative learning. This research has demonstrated that cooperative learning offers numerous advantages. For instance, communication anxiety diminishes, enabling students to speak without fear, allowing them to capitalise on their efforts. Students' self-esteem increases when working in teams, as the group environment fosters a sense of safety and belonging. Students collaborating towards a common goal exhibit higher motivation level and a desire to excel. Furthermore, girls have shown greater emotional sensitivity regarding communication, but through cooperative learning, these values can be modified and improved.

This study illustrates that classroom activities actively, positively, and beneficially contribute to development of the students' personalities. Therefore, I advocate for further exploration of this research theme across other educational cycles. My future goal is to expand this theme using a larger sample, applying questionnaires to different age groups to identify additional potential benefits of cooperative learning in the instructional-educational process.

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