



## **The Effects of Cooperative Learning on Creative Writing and Self-Efficacy in Portuguese and Mathematics**

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Cooperative learning is a pedagogical practice widely endorsed in the literature to enhance students' creative writing skills. This methodology promotes the development of originality, fosters openness to new ideas, provides opportunities for interaction and tossing ideas around, and subsequently contributes to boosting creative textual production. This study aims to assess the impact of incorporating cooperative learning strategies on developing creative writing skills and enhancing self-efficacy among 6th-grade students. Additionally, this study reflects on using cooperative learning methods in the classroom setting, namely the roundtable and the cooperative graffiti. The participants were 34 students from two classes of the 6th grade of the 2nd cycle of basic school: an experimental group, where cooperative learning applies, and a control group, conducted using a traditional lecture. The study used a quasi-experimental design, incorporating pre-test and post-test. The non-parametric Wilcoxon signed-rank test was used to assess within-group changes in pre-test and post-test scores for both the experimental and control groups. The findings from both classes suggest that cooperative learning is more effective than a traditional lecture in building creative writing skills and self-efficacy in Portuguese (first language) and maths.

**Keywords:** cooperative learning, creative writing, self-efficacy, Portuguese, Maths

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## **INTRODUCTION**

Systematic reviews on writing teaching in the last decades reveal teachers' concern with the writing process, i.e., how students develop and refine their writing skills, instead of focusing on the writing product. However, international research on teaching writing suggests that teachers prioritize prescribed writing skills assessed in high-stakes tests, leading to a decline in creative teaching practices, and this trend commonly manifests in the adoption of a genre-based approach to writing (Barton et al., 2023; Göçen, 2019; Slavin et al., 2019).

Slavin et al. (2019) review of research on outcomes of writing programs for students in primary and secondary schools highlights studies concerned with integrating reading and writing, models of the writing process, teaching meta-cognitive strategies, and cooperative learning writing programs. Schools and teachers must prepare students to navigate a complex and uncertain world (OECD, 2018). Future-ready students need a safe and supportive learning environment that motivates each student to collaborate with others. When students work together on a project, they are encouraged to explore different viewpoints and to assume calculated risks. This may help them generate more innovative ideas and solutions and boost their confidence in their abilities.

Despite acknowledging the significance of creative writing, there is a gap in particular research on the objectives and approaches that can assist teachers in conducting creative writing exercises (Gilbert, 2021).

In the literature, however, we observe a lack of research about the possible effects of cooperative learning on enhancing creative writing skills and students' self-efficacy (Barton et al., 2023).

Similarly, despite recognizing that successful writing strategies must be intentionally structured to enhance students' confidence, research on this topic is still scarce.

So, this study aims to evaluate the effects of cooperative methods graffiti and the roundtable on enhancing creative writing skills and self-efficacy in 6th-grade students compared to traditional lecture.

## **Literature Review**

### **Cooperative learning**

Cooperative learning is an interactive educational approach centered on students working in heterogeneous small groups, exchanging ideas, and collaborating to achieve shared learning goals (Johnson & Johnson, 2014). For a group to be cooperative, the five basic elements that make cooperation possible must be explicitly incorporated into the learning activities. According to most authors (Johnson et al., 1999; Pujolàs, 2009; Slavin, 1995), these elements are positive interdependence, individual and group accountability, promotive interaction, preferably face-to-face, interpersonal and small group skills, and group evaluation or reflection on the work done by the group.

This methodology has been extensively researched and has consistently demonstrated favorable outcomes regarding students' academic achievements across various grade levels and subject areas (Gillies, 2016). Multiple studies have consistently found that

the implementation of cooperative learning has resulted in improved academic achievement for students across various subjects such as science, mathematics, and language classes, either in their mother tongue or second languages (Bassachs et al., 2022; Prieto-Saborit et al., 2021; Silva et al., 2022; Yusuf et al., 2019). Cooperative learning fosters students' acquisition of knowledge and their development of personal, interpersonal, and social skills and critical and creative thinking (Silva et al., 2019). Also, cooperative learning has positively impacted students' writing skills (Ismail & Maasum, 2009; Khan, 2015; Munawar & Chaudhary, 2019). Furthermore, these benefits have been observed in both primary and higher education settings (Baliya, 2013).

### **Creative Writing**

Literature offers multiple definitions of creative writing. Behind the different conceptual perspectives, creative writing definitions commonly involve imagination, emotion, choice, and originality. In general terms, creative writing is associated with the originality of thought and expression. It differs from normal writing because it involves a higher level of complexity and deeper reflection on what to write, demands clarity in ideas, and invites students to explore their thoughts before starting to write (Cosgrove, 2021; May, 2007). Engaging in creative writing is often regarded as one of the most effective methods to stimulate cognitive processes and foster imagination and divergent thinking (Barbeiro, 1999; Barbot et al., 2012). Wang (2019, p. 111) states that “from the democratic, aesthetic and motivative perspectives, it is time to rethink creative writing as an art form, one which can play a significant role in helping students express their voices freely and generate creativity.” In this sense, creative writing is a means of assisting students' personal and social growth. Reflecting on the reasons to teach creative writing, Gilbert (2021) states further that some teachers may use creative writing to foster students' critiques about the world and to promote deep learning. Also, Clifton (2022) emphasizes “critical-creative literacy” as one of the goals of creative writing education. In language learning, mother tongue or second language, creative writing can help students gain extra motivation “by giving them more space and time for self-expression and helping them experience the beauty of language” (Wang, 2019, p. 110).

The educational goal of creative writing in schools is not to create literary geniuses, especially in primary and intermediate education. In the *Profile of Students Leaving Compulsory Education*, a document from the Portuguese Government with guidance for teachers, creativity is defined as the ability to generate and apply new ideas in specific contexts, approach situations from different perspectives, identify alternative solutions and establish new scenarios (Martins et al., 2017, p. 24). In *Thinking Outside the Box* (OECD, 2022), creativity is assumed to drive forward human culture and society; this assumption is a crucial base for incorporating the assessment of creative thinking in PISA 2022.

The criteria for assessing students' creative works might vary significantly, primarily according to the various dimensions of creativity that educators prioritize. Research on creative thinking typically focuses on fluency (ability to generate a large number of ideas or solutions to problems), flexibility (ability to propose various approaches to a

particular problem simultaneously), elaboration (ability to systematize and organize the details of an idea), and originality (ability to generate new and original ideas) as the primary cognitive processes that are used to define and assess creativity, in line with the Torrance Tests of Creative Thinking (TTCT), developed by E. Paul Torrance in the 1960s (e.g., Alabbasi et al., 2022).

### **Self-Efficacy**

Albert Bandura defines self-efficacy as the individual's belief in his ability to organize and execute a course of action to produce desired results (Bandura, 1977; 2006). In other terms, self-efficacy refers to students' perception and belief in their abilities to perform specific acts to succeed in challenging situations, such as reading, writing, or solving mathematical problems. Perceived self-efficacy is influential in human self-development, adaptation, and change. In a brief revision of studies on self-efficacy, Bandura (2006, p. 309) concludes that efficacy beliefs affect an individual's behavior and impact other factors such as goals and aspirations, expectations of outcomes, affective proclivities, and perception of obstacles and opportunities. They also impact individuals' decision-making processes, the objectives and aspirations they establish for themselves, and their level of dedication toward achieving them. Furthermore, they influence the amount of effort individuals exert in their endeavors, their expectations for the outcome of their efforts, their ability to persist, their emotional well-being, and their writing fluency. These benefits contribute to a more engaging and enriched student learning experience, nurturing their creativity and writing abilities (e.g., Ismail & Maasum, 2009; Khan, 2015; Munawar & Chaudhary, 2019). Also Deviana et al. (2019) and Puozzo and Audrin (2021) find a positive relationship between self-efficacy and creative writing skills.

Research has shown a positive relationship between creative writing and self-efficacy in both mathematics and Portuguese. Kaur (2021) found that a writing intervention in mathematics led to increased self-confidence and enjoyment. Simão et al. (2016) raised concerns about the quality of writing instruction in both Portugal and Brazil, suggesting a need for improved teaching practices. These findings suggest that creative writing can enhance self-efficacy in both mathematics and Portuguese, but effective teaching methods are crucial.

### **METHOD**

A quasi-experimental design was implemented, featuring two non-equivalent groups subjected to pre and post-tests. The impact of the intervention was evaluated using the Wilcoxon signed-rank test, to assess changes in pre-test and post-test scores within the experimental and control groups. This analysis is a non-parametric technique suitable for paired data, while making no assumptions about the normality of the data. We used significance levels of 0.01 and 0.05 to determine statistically significant changes within each group. The statistical analyses were performed using IBM SPSS (v.25).

### **Participants**

Thirty-four students, from two intact classrooms (Campbell & Stanley, 2015), participated in the study: 16 from the experimental group (6 male and 10 female) and 18 (9 male and 9 female) from the control group, aged 11 to 12.

### **Instruments**

For this study, a test was conceived to evaluate the creative writing skills of basic school students, as there was no such test in Portugal. The test was constructed following Barbeiro's (1999) definition of creative writing and aimed to elicit creative written responses based on a sequence of six illustrations centered around the theme of a sea trip voyage, namely "A dive to the bottom of the sea." Images catalyze imaginative and creative thinking, propelling children into new mental landscapes. An observation rubric was created to assess the creative writing outputs. This rubric includes six parameters: elaboration, fluency, originality, flexibility, textual organization (including cohesion and syntax), and expressive resources. Elaboration relates to giving specific details, expanding simple suggestions in order to a more enlarged text; fluency refers to the variety of ideas present in the text and the path and development of ideas; originality is the ability to come up with new and creative ideas; flexibility refers to the ability to change paths, replace one model with another, adopt new ways of seeing, thinking and producing ideas and solutions; textual organization refers to the respect of cohesion and the relation among textual sequences; and expressive resources refers to the use of at least three stylistic figures.

These characteristics adhere to the standards of the creative writing test, where a maximum of 5 points is assigned to each. Points are awarded depending on the dimensions of creative writing evaluated in each question, according to its quality and quantity, being evaluated by two judges. The intra-rater reliability of judges 1 and 2 ranged from 0.87 to 0.90 (Cohen's kappa).

We used the Academic Self-Efficacy Scale (EAEA), adapted by Neves and Faria (2006), to gather data on self-efficacy. This scale assesses students' expectations of academic success during the current school year. It comprises 26 items categorized into six response types, ranging from "Totally Disagree" to "Totally Agree." The items encompass general school, mathematics, and Portuguese self-efficacy. Students were asked to indicate their level of agreement with these items, employing a 6-point Likert scale, wherein higher scores signify elevated self-efficacy expectations. The authors reported acceptable levels of internal consistency with a Cronbach's alpha of 0.88 (general = 0.88; Portuguese = 0.87; Mathematics = 0.95).

### **Ethical considerations**

This study followed the ethical requirements of the EFPA - European Federation of Psychologists' Associations (EFPA) and the OPP - Ordem dos Psicólogos Portugueses [Portuguese Psychologists' Association]. All ethical principles were respected, ensuring that all participants knew and accepted the principles of informed consent, voluntary participation, and confidentiality of their answers.

### **Pedagogical Context and Procedures**

#### **Experimental group**

The activities were designed and implemented to foster the development of creative writing skills and instill a sense of self-efficacy in students. The instructional intervention was conducted throughout fifteen sessions, each lasting 90 minutes. It encompassed the participation of a highly experienced teacher in cooperative learning

with two decades of professional expertise. In the experimental group, creative writing activities were conducted utilizing cooperative graffiti and roundtable methods (Table 1).

#### *Cooperative Graffiti*

The cooperative graffiti method is suitable for use in various subject areas, including languages, natural sciences, social sciences, and artistic education. It promotes creative thinking by facilitating idea generation and written expression. Notably, it is an inclusive approach that accommodates the participation of all students, including those with special educational needs. Lopes and Silva (2022) argue that this method nurtures critical and creative thinking, cognitive flexibility, written language skills, and personal responsibility. Furthermore, it enables educators to measure students' prior knowledge and comprehension of specific content, among other objectives.

The implementation of this method requires the formation of small and heterogeneous groups comprising three or four students. Each group member is assigned a specific role (e.g., reader, checker, secretary) to ensure the active participation of all students. Each group is provided with a sheet to record their ideas. Students are allotted time to write their thoughts on the topic under consideration, preferably using different colored markers for distinct questions or sections. After the designated time, students cease writing and combine their ideas, analyzing commonalities and differences. The completed sheet represents the group's graffiti, which is subsequently presented to the class.

#### *Roundtable*

The roundtable method is versatile and applicable to all subjects and educational levels. It facilitates the sharing and consolidation of knowledge, cultivates creativity, fosters creative writing, encourages brainstorming, and promotes interaction among students with diverse perspectives (Kagan, 1994; Silva et al., 2018). The teacher forms heterogeneous groups of three or four students to implement this method, providing each group with a single pencil and a task sheet. The task sheet circulates within the group clockwise, with each student contributing within a predetermined time frame. The teacher may select the student to initiate the activity or allow students to choose.

Additionally, the teacher designates or allows students to select a group spokesperson to share the group's ideas with the class. Each student has a set time to contribute before passing the task sheet to the next student. This process continues until the teacher-designated time expires. Once the activity concludes, each spokesperson presents the group's final work to the class (Silva et al., 2018).

Table 1

Activities and creative writing strategies employed

Activities	Experimental class	Control class
A story on the loose on my street	Cooperative graffiti	Lecture / Individual work
Write a request for help in the sand	Cooperative graffiti	Lecture / Individual work
Visual poem	Roundtable	Lecture / Individual work
Favourite character from the work Ali Baba and the Forty Thieves	Roundtable	Lecture / Individual work
Summary of a chapter from the work Ali Baba and the Forty Thieves	Roundtable	Lecture / Individual work

### Control group

The creative writing exercises employed in the control class were identical to those implemented in the experimental class, albeit using more conventional techniques: lecturing and explanatory methods. The teacher had over two decades of experience without utilizing cooperative learning. She took a position of control, providing explanations on the subject matter and delivering instructions for engaging students in individual creative writing exercises.

## FINDINGS AND DISCUSSION

### Cooperative Learning and Creative Writing

The main finding of this study is that cooperative learning has a beneficial effect on students' creative writing, evident across all assessed aspects, as shown below in Table 2. The results indicate statistically significant differences in the mean scores of fluency, originality, textual organization, expressive resources (i.e., figures of speech), and overall creative writing between the pre-test and post-test evaluations in the experimental group. There were no statistically significant differences in the mean scores of the creative writing test across any of its dimensions between the pre-test and post-test in the control class.

Table 2  
Results of the creative writing test

Dimensions	Class		Mean	Standard deviation	Wilcoxon test
Elaboration	Experimental (N=16)	Pre-test	4.0	1.03	Z= -1.89. p= .059
		Post-test	4.62	0.81	
	Control (N= 18)	Pre-test	3.22	0.94	Z= -1.00. p= .317
		Post-test	3.11	1.08	
Fluency	Experimental (N=16)	Pre-test	3.5	0.89	Z= -3.00. p= .003**
		Post-test	4.62	0.80	
	Control (N= 18)	Pre-test	2.33	1.53	Z= -1.00. p= .317
		Post-test	2.44	1.5	
Originality	Experimental (N=16)	Pre-test	2.87	0.88	Z= -2.82. p= .005**
		Post-test	3.87	1.02	
	Control (N= 18)	Pre-test	2.11	1.57	Z= -1.63. p= .102
		Post-test	2.56	1.46	
Flexibility	Experimental (N=16)	Pre-test	3.25	1.24	Z= -0.302. p= .763
		Post-test	3.38	0.81	
	Control (N= 18)	Pre-test	2.0	1.41	Z= -0.447. p= .655
		Post-test	2.11	1.57	
Textual organization	Experimental (N=16)	Pre-test	3.0	1.27	Z= -3.35. p= .001**
		Post-test	5.0	0.0	
	Control (N= 18)	Pre-test	2.56	1.29	Z= -1.00. p= .317
		Post-test	2.44	1.15	
Expressive resources	Experimental (N=16)	Pre-test	2.13	1.02	Z= -2.64. p= .008**
		Post-test	3.38	0.81	
	Control (N= 18)	Pre-test	1.56	0.92	Z= 0.00. p= 1
		Post-test	1.56	1.15	
Creative writing overall	Experimental (N=16)	Pre-test	18.75	3.92	Z= -3.53. p< .000**
		Post-test	24.88	1.63	
	Control (N= 18)	Pre-test	13.78	6.86	Z= -0.666. p= .506
		Post-test	14.22	6.61	

\* - significant at level 5%; \*\* - significant at level 1%.

Results in the experimental group's pretest and post-test evidence that students not only had statistically significant improvements in their writing scores but also showed positive advances in the dimensions evaluated, especially on fluency, originality, textual organization, and expressive resources (or figures of speech).

These findings align with research examining the influence of cooperative learning on writing learning in general and specifically on the development of creative writing. Several empirical studies provide evidence for the effectiveness of cooperative writing practices in students' writing motivation and proficiency (e.g., De Bernardi & Antolini, 2007; Ismail & Maasum, 2009; Khan, 2015). Yusuf et al. (2019) conclude that using cooperative learning methods encourage students to work harder to improve their writing skills. Munawar and Chaudhary (2019) derive similar conclusions and additionally discover that cooperative learning methods had a substantial and enduring influence on the texts of their 7th-grade students, even after four months of intervention. Slavin et al. (2019), in a review of writing methods in years 3 to 13, emphasize that motivating environments and cooperative learning are important characteristics of writing programs. In reflecting on the design of instructional lessons to address the needs of different students, Graham (2019) also reinforces the role of cooperative learning methodology. In contrast to the conclusions above, Vega and Hederich (2015) observe significant differences exclusively in mathematics when examining the effects of cooperative learning on 4th-grade students' performance in language and mathematics.

Considering the essential skills for creative writing, it is not surprising that cooperative learning fosters students' performance. Barbot et al. (2012) consider six broad categories of factors in creative writing: general knowledge and cognition, creative cognition, executive functioning; motivation and other cognitive characteristics, linguistic and literary; and psychomotor. Students who engage in cooperative learning can effectively utilize their individual and social characteristics to achieve the objectives of a given task. Cooperative learning fosters students to brainstorm and share ideas with their peers; this collaborative process often leads to a wider range of ideas and perspectives, as well as writing styles and genres, which can stimulate creativity in their writing. Working in groups can boost students' motivation to write creatively. When they work together and share their work with peers, they often become more enthusiastic and persistent in problem-solving tasks and achieving common goals (Johnson & Johnson, 1999, 2014). Furthermore, cooperative learning offers students several chances to revise and evaluate one another's writing; exchanging and getting constructive feedback from peers can enhance the quality of their writing.

### **Cooperative Learning, Creative Writing, and Self-Efficacy**

Regarding the academic self-efficacy scale (Table 3), applied before and after the instructional intervention on creative writing, findings evidence the positive impact of the implemented methods in Portuguese (mother tongue).



Table 3  
Results of the academic self-efficacy scale

Dimension	Class		Mean	Standard deviation	Wilcoxon test
General school self-efficacy	Experimental (N=16)	Pre-test	40.19	6.26	Z= -1.20. p= .230
		Post-test	40.63	6.33	
	Control (N= 18)	Pre-test	28.88	10.60	Z= -1.55. p= .121
		Post-test	28.50	10.90	
Self-efficacy in Maths	Experimental (N=16)	Pre-test	47.18	10.18	Z= -2.17. p= .030*
		Post-test	46.38	10.19	
	Control (N= 18)	Pre-test	30.44	13.12	Z= -0.848. p= .397
		Post-test	31.33	13.46	
Self-efficacy in Portuguese	Experimental (N=16)	Pre-test	37.50	6.69	Z= -3.21. p= .001**
		Post-test	39.63	6.71	
	Control (N= 18)	Pre-test	29.00	10.68	Z= -0.952. p= .341
		Post-test	28.61	10.94	

\* - significant at level 5%; \*\* - significant at level 1%.

In the experimental group, there was a statistically significant difference in the mean self-efficacy scores in Maths and Portuguese from pre to post-test. In the control group, no statistically significant differences were observed in any subscales when comparing the pre and post-test results. These findings suggest that the creative writing tasks accomplished in cooperative groups positively increased students' self-efficacy belief.

Several studies emphasize the positive impact of cooperative learning on perceived self-efficacy and confidence. Johnson and Johnson (2014) assume that "joint efforts to achieve mutual goals promote higher self-esteem, self-efficacy, personal control, and confidence in their competencies" (p. 843). Pajares and Valiante (1997) found the positive influence of writing self-efficacy on the essay writing of 5th-grade students. In a study involving 4th-grade pupils, Bulut (2017) discovers that writing self-efficacy beliefs and attitudes are highly correlated and influence summary writing. Studies involving students in other grade levels have yielded identical results (e.g., De Smedt et al., 2016; Diab, 2019). De Bernardi and Antolini (2007) conclude that collaborative settings decrease anxiety about the activity and favor a higher sense of self-efficacy. More recently, Santos and Alliprandini (2023), in a collaborative intervention with college students from a Pedagogy class, identified positive effects in the perception of academic self-efficacy, in parallel with decreased anxiety, greater attitude towards studies, and improvements in the use of strategies to perform tests and selection of the main ideas. Roundtable technique was effective to be used to teach the students with low self-efficacy to write descriptive text (Fauziah et al., 2020). In contrast, Fernandez-Rio et al. (2017) study, which examines the interplay among self-regulated learning, cooperative learning, and academic self-efficacy among secondary education students, deviates from the majority of conducted research in that it found self-regulated learning to have a greater impact on student's academic self-efficacy than cooperative learning.

According to research, writing development generally influences and is influenced by a sense of efficacy. This process appears to be facilitated when students engage in collaborative and creative learning environments. Cooperative learning fosters a positive and supportive classroom atmosphere, enhances motivation by promoting

group cohesion, and makes learning more engaging by breaking monotony and actively involving students in tasks, ultimately boosting learners' self-efficacy and confidence through encouragement and cooperation (Bandura, 2006).

### **CONCLUSIONS AND RECOMMENDATIONS**

This study aimed to analyze whether cooperative learning using the roundtable and cooperative graffiti methods promotes creative writing skills and self-efficacy in Maths and Portuguese than the traditional method (lecture and individual work) in 6th-grade students. The findings indicate statistically significant variations in the mean scores of fluency, originality, textual organization, expressive resources, and the overall creative writing test between the pre-test and post-test assessments in the experimental group. Regarding self-efficacy, findings also indicate statistically significant positive effects on the experimental group.

Research focused on developing creative writing through cooperative learning methods is still scarce. The research on the relationship between cooperative learning, creative writing, and self-efficacy is even more limited. The findings of this quasi-experimental study, involving 6th-grade students in experimental and control groups, show that implementing cooperative learning yields favorable results regarding students' self-efficacy and ability to generate creative texts in Portuguese.

This study's conclusions confirm findings commonly noticed in studies that primarily focus on the effects of cooperative learning in creative writing and self-efficacy, alone or in combination.

A limitation of our study is that the researcher could only conduct the instructional intervention for fifteen sessions in seven weeks. It is expected that a longer and more extensive intervention involving other language skills, such as listening, speaking, reading, and non-creative writing, would have more prominent effects, particularly about the perceived self-efficacy.

Preparing for active citizenship and present and future complexities demands teachers to develop their students' creativity and cooperative abilities. It is expected that teachers can use cooperative learning, particularly the Cooperative Graffiti and the Roundtable, to increase creative writing skills and self-efficacy beliefs. Collaborative efforts and networked forms of expertise are increasingly needed in society to solve problems and generate new values. Creativity and collaboration are two major challenges in the 21st century. When conducting their research (or activities) and when selecting pedagogical methods and tools to implement in the classroom with their students, educators must bear in mind this OECD's statement: "Increasingly, innovation springs not from individuals thinking and working alone, but through cooperation and collaboration with others to draw on existing knowledge to create new knowledge" (OECD, 2018, p. 5).

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