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A Comparative Investigation of the Effects of Metacognitive, Cooperative and Metacognitive-Cooperative Instructions on Iranian EFL Learners' Writing Improvement

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Abstract

The aim of this study was to examine the impact of metacognitive-cooperative training on the writing skills of Iranian EFL learners. The study employed quasi-experimental design. To this aim, four intact classes were randomly allocated into three experimental groups and one control group. The findings from the initial assessments indicated that the individuals involved in the study exhibited a similar level of language competence and writing skills, ascertained by the Oxford Quick Placement Test (OQPT) and a pretest specifically designed to evaluate writing abilities. Consequently, a total of 120 Iranian EFL learners, selected from a subject pool of 160 individuals at the upper-intermediate level, were designated as the participants for this study. The selected subjects were subsequently divided into four distinct groups, namely three experimental groups (EG1, EG2, EG3) and one control group (CG). The experimental groups (EG1, EG2, and EG3) received instruction on cooperative learning, metacognitive strategies, and a combination of metacognitive and cooperative learning, respectively. Conversely, the control group (CG) adhered to a conventional curriculum for writing. Subsequently, a posttest was conducted. Having conducted the Wilcoxon-Signed Rank Test, the researchers figured out that the instructional methods of cooperation, metacognition, and metacognitive-cooperation significantly influenced the improvement of writing skills among Iranian EFL learners. Based on the outcomes of the ANCOVA test, the researchers reached the conclusion that the metacognitive-cooperative group exhibited superior performance compared to the groups that received solely cooperative or metacognitive instruction. The study's pedagogical implications have been thoroughly discussed.

Keywords: cooperative learning, EFL writing, information-process load, metacognition, monitoring, self-regulated learning, strategic reasoning

1. Introduction

Writing is considered as one of the most important criteria for qualified personnel in the 21st century (Wen, 1996). However, as Gentil (2011) argues, it is a multicomponent skill and is considered as one of the most complex and challenging skills for EFL learners. It encompasses the fundamental phases of planning, goal setting, information organization, and evaluation in which EFL students need help (Yarrow & Topping, 2001). To surmount these challenges, EFL learners must cultivate a comprehension of metacognitive information to enhance their writing abilities, as well as a self-regulatory mechanism to initiate and sustain cognitive processes, actions, and emotions during the process of learning to write (Teng, 2020). Metacognition, as put forward by Flavell (1979), consists of two parts including metacognitive knowledge and regulation.

Regarding the importance of metacognition, O'Malley et al. (1985) stated that "students without metacognitive approaches are learners without direction and ability to review their progress, accomplishments, and future directions (O'Mally & Chamot, 1985, p. 43). Teng and Huang (2019) also argued that metacognitive strategies enhance the EFL students' writing performance and facilitate the process of acquiring writing skills. Studies conducted at EFL institution have yielded promising findings about the effectiveness of metacognitive instruction in writing classes (e.g., Nguyen & Gu, 2013; Teng, 2016). Metacognitive strategies such as planning, monitoring, reviewing, and assessing have a direct correlation with writing. Consequently, teaching metacognitive strategies can help learners synchronize their cognitive processes with their writing goals (Hayes, 2012; Hayes & Flower, 1980). The justification for employing metacognitive training is in the fact that metacognition serves as a problem-solving mechanism, directing learners to utilize a repertoire of methods to optimize their writing proficiency (Santelmann et al., 2018).

To fully optimize the effectiveness of metacognitive instruction, it is imperative for students to actively participate in group interactions centered around writing (Teng, 2016). Thus, utilizing cooperative learning is crucial for effectively facilitating the process of creating instructions (Rosa-Velardo et al., 1997). Daiute and Dalton (1993) asserted that the process of acquiring writing skills is impacted by various aspects, such as the discourse among students belonging to diverse sociocultural backgrounds. Vygotsky (1978) proposed a theoretical framework to investigate the influence of social contact on the cognitive development of writing. He discovered the societal roots of symbolic development in learners' collaborative attempts to address tangible cognitive challenges. According to the theory, thinking happens between people before it happens within an individual (Lam & Kapur, 2017). The justification for employing collaborative learning is that learners are anticipated to engage in multiple sub-processes during the writing process, such as information retrieval, logical thinking, persuasive discourse, critical thinking, troubleshooting, assessment, and seven revisions (Storch, 2005). These activities necessitate writers to contemplate several viewpoints and amalgamate them into a cohesive approach to EFL writing. Therefore, in addition to teaching metacognitive writing strategies, collaborative writing is another efficient method to promote student interaction and improve their writing (Teng, 2021).

1.1 Statement of the Problem

Cooperative learning and metacognitive strategies are mutually supportive. Each approach is associated with the act of writing, a multifaceted social-cognitive process where writers must adjust their objectives to complete a task. Furthermore, in collaborative learning environments, learners employ metacognitive abilities, both consciously and unconsciously, to accomplish writing-related goals. According to Slavin and Karweit (1985), metacognitive strategies enhance cooperative learning by enabling learners to effectively monitor and reflect on their learning processes, hence promoting successful cooperative learning. Furthermore, specific writing tasks carried out within social settings might be seen as forms of communication. In such instances, learners must cultivate a consciousness of culturally distinctive systems of symbols (such as language or writing) by means of exposure to the information in the surroundings. In this context, the integration of cooperative learning and metacognitive training can assist learners in acquiring the necessary abilities to convert their thoughts into written form.

It is important to have a well-organized approach while teaching writing in an English as a Foreign Language (EFL) setting, as students might easily lose focus when working together on writing tasks. Incorporating metacognitive instruction can be beneficial in organizing students' collaborative writing. Therefore, the combination of cooperative learning and metacognitive training has the potential to be combined to optimize writing achievement. Although research has demonstrated the efficacy of metacognitive instruction (Nguyen & Gu, 2013) and advantages of collaborative learning (Li & Zhu, 2017) in writing and metacognitive and collaborative learning skills have been identified by certain scholars (e.g., Ortega, 2012) as essential elements of academic writing, further investigation is needed to specifically examine the impact of incorporating metacognitive education into collaborative writing as a means to improve students' writing abilities. As a result, the researchers of the present study formulated the subsequent

research questions:

1. Does cooperative instruction have any statistically significant effect on Iranian EFL learners' writing improvement?
2. Does metacognitive instruction have any statistically significant effect on Iranian EFL learners' writing improvement?
3. Does metacognitive-cooperative instruction have any statistically significant effect on Iranian EFL learners' writing improvement?
4. Is there any statistically significant difference among the effect of metacognitive, cooperative, and metacognitive-cooperative instruction on Iranian EFL learners' writing improvement?

2. Literature Review

2.1 Metacognition

Metacognition encompasses the cognitive ability to engage in intellectual reflection about the process of learning, as well as the ability to strategically plan, monitor, and manage one's own acquisition of knowledge (Flavell, 1979). The word typically encompasses two concurrent processes: self-regulating one's own learning process and implementing tactics to enhance such process. Metacognition can be further categorized into two distinct components: According to Flavell (1979), the concept of metacognition pertains to an individual's understanding and awareness of their own cognitive processes. The processes encompass comprehending the personal strengths and limitations that impact an individual's performance (declarative knowledge); the knowledge required to proficiently accomplish a task (procedural knowledge); and the knowledge associated with employing strategies to acquire information (conditional knowledge). The metacognition regulation, according to Flavell (1979), pertains to the way learners exercise control over their learning processes. This involves the deliberate selection of suitable strategies and the allocation of resources for the purpose of learning, commonly referred to as planning. Additionally, it encompasses the act of self-assessing one's own ability to comprehend and achieve the desired performance targets of a given task, known as monitoring. Lastly, it involves the critical evaluation of task performance and the efficiency of the learning process itself (Flavell, 1979).

2.2 Cooperation

Cooperative learning is an instructional strategy wherein students engage in group collaboration to accomplish a particular activity, task, problem, project, or educational objective, with their teacher serving as a guide or facilitator (Slavin, 1980). Several research have clarified the influence of cooperative learning on the comprehensive development and progress of pupils. As an illustration, Slavin (2014) proposed that the use of cooperative learning strategies can augment individuals' dedication to collaborative tasks and yield advantageous outcomes in terms of individual academic performance. The active participation and involvement of students in collaborative discussions can facilitate the cultivation of analytical reasoning skills in relation to intricate issues, as well as foster self-reflection on individual academic progress. Holt, Chips, and Wallace (1991) highlighted the potential efficacy of cooperative learning in facilitating the acquisition of new academic and English language skills in classrooms comprising students from varied linguistic and cultural backgrounds.

2.3 Previous Studies on the Role of Metacognition and Cooperation in the Development of Writing

Several research (Ofte, 2014; Ong & Zhang, 2013; Teng, 2020a) have reported findings that suggest a relationship between metacognition and the quality of written texts. The study, conducted by Ong and Zhang (2013), discovered that the awareness of metacognitive processes influences the regulation of the writing procedure. In her study, Larkin (2009) gathered data by employing a blend of video-based surveillance, reflective analysis of instruction, and written records, amounting to a cumulative observation time of 25 hours. The results of her investigation suggested that the utilization of metacognitive skills has a positive impact on the writing process. The study conducted by Teng (2020a) centered on the examination of metacognitive awareness and writing performance among EFL students. The findings of the study revealed that metacognitive control emerged as a significant indicator of EFL writing. According to Teng (2020b), the inclusion of guidelines for receiving feedback from a group within the context of metacognitive instruction was found to enhance the writing ability of Chinese EFL students when compared to the inclusion of self-explanation guidance within a metacognitive training context. According to Bui and Kong (2019), the implementation of metacognitive training has the potential to improve the peer review process for young learners, facilitating their development into self-regulated learners.

Some studies (Hosseini, Izadpanah, & Fasih, 2020) discussed the significant effect of metacognitive strategy training

on other skills (e.g., listening). Having conducted ANOVA, the researchers concluded that metacognitive strategy had a significant effect on Iranian EFL learners' listening comprehension. While some students have observed that the provision of metacognitive instruction can facilitate the application of previously acquired metacognitive skills to novel learning contexts (Mevarch & Amrang, 2008; Mevarech & Kramarski, 2003), further research is required to examine the potential benefits of metacognitive skills for learners engaged in more demanding and laborious writing tasks.

Moreover, research has examined the impact of collaborative learning on students' ability to write. Rosa-Velardo et al. (1997) utilized various cooperative learning frameworks, such as round-table discussions and think-pair-share activities, within the context of writing tasks. Research has indicated that the utilization of cooperative learning strategies has been associated with notable advantages in the enhancement of writing proficiency. In a study conducted by Elola and Oskoz (2010), it was observed that engaging in collaborative synchronous exchanges had a positive impact on learners' ability to concentrate on writing, particularly when involved in complimentary writing assignments. Chalak and Karimi (2022), employing a quasi-experimental pretest-posttest design, also investigated collaborative writing among 50 Iranian intermediate EFL learners and figured out that collaborative writing enhances learners' writing accuracy. Movahedi and Aghajanzadeh Kiasi (2021) also, having examined 30 intermediate students concluded that students' collaboration in assessment promotes their writing ability.

In relation to the drawbacks of cooperative learning, Kagan and High (2002) put up the contention that children deficient in social skills may have difficulties when participating in group work, perhaps leading to disagreements in task execution. Furthermore, it is important to note that cooperative group learners who do not possess metacognitive skills may face challenges in effectively monitoring and contemplating their learning processes. The impact of learners' metacognitive skills on the efficacy of cooperative learning has been identified in previous research conducted by Mevarech and Kramarski (1997). The lack of these skills creates an opportunity for more integrated metacognitive education to explore the possibilities of cooperative learning (Zion et al., 2005).

3. Methodology

3.1 Design of the Study

This section outlines quantitative research with an experimental design. It involves control, experimental groups, pretest, posttest, and treatment. The experimental design includes an intervention study with four groups: three experimental groups receiving specific treatments and one control group providing a baseline for comparison. The experimental groups consist of homogenized learners instructed with cooperative learning methods, metacognition strategies, and a combination of both. The aim is to measure changes over time or from different treatments, precisely the impact of metacognitive-cooperative instruction on the enhancement of writing skills among Iranian EFL learners.

3.2 Participants

The participants were from a subject pool of 160 EFL students majoring in English at Islamic Azad University in Iran. They participated in an essay writing course. The participants' first language was Persian. They were males and females with the age range of 17 to 24. To examine the participants' homogeneity, the researchers employed OQPT. The students whose scores were between 37 and 47 were selected (i.e., upper-intermediate level of language proficiency) as the subjects of the present study. Moreover, the researchers used a pretest of writing to ensure the subjects' homogeneity in terms of writing ability. As a result, 40 EFL learners were excluded because of low language proficiency and lack of interest. The rest were equally and randomly assigned to three experimental and one control groups.

3.3 Instruments

The study utilized three instruments including: OQPT and a pre- and post-test of writing.

3.3.1 Oxford Quick Placement Test (OQPT)

To assess the homogeneity of the participants' language skills, the Oxford Quick Placement Test was administered. Allan (2004) posits that the OQPT examination is a valid assessment tool for evaluating the English language competency of learners across various levels. The test consisted of a total of 60 items in the format of multiple-choice questions. The pupils undergo assessment to evaluate their comprehension of grammatical structure and lexical repertoire. Typically, those taking tests are instructed to carefully examine the sentence fragment including a blank space, and thereafter select the most appropriate option from the given choices that effectively completes the phrase. The allotted time for participants to respond to the questions is 30 minutes. Individuals who obtain scores ranging from 18 to 27 are classified as elementary learners, while those who achieve scores ranging from 28 to 36 are categorized as lower-intermediate learners. Furthermore, individuals who attain scores ranging from 37 to 47 are

classified as upper-intermediate learners.

3.3.2 Pre- and post- test of writing

To assess the writing proficiency of the participants, a pretest was administered in the form of an IELTS writing task 2. The participants were allocated a duration of 40 minutes to compose an essay consisting of 200 words. Following a series of 32 instructional sessions, each lasting one hour, the researchers proceeded to review and provide corrections for the written assignments. Subsequently, a post-test writing task was administered to assess any potential advancements in writing proficiency.

3.4 Procedure

The study was carried out in three primary stages: pre-test, treatment (consisting of metacognitive, cooperative, and metacognitive-cooperative teaching), and post-test. During the pre-test phase, a total of 160 students underwent OQPT to guarantee that they were homogenized based on their level of English language proficiency. From this group, 120 EFL students whose scores were between 37-47 were chosen as upper-intermediate participants. Next, the participants were given an argumentative writing task from IELTS writing task 2 as a pretest to ensure their homogeneity regarding writing ability.

As a result, the homogenized participants (N=120) were devoted to four groups: one control group (CG) and three experimental groups. The four groups were equal in terms of class time, context, writing tasks, topics, and techniques. The only difference was the use of independent variables of the study (i.e., metacognition and cooperative learning) in experimental groups to find their potential effects on students' writing ability.

The first experimental group (EG1) was provided with 6 sessions of instruction on metacognitive methods as a component of their writing course. The current study included metacognitive education, drawing from Veenman et al.'s (2006) research. This instruction focused on two aspects of metacognition: knowledge (including declarative, procedural, and conditional knowledge) and regulation (including planning, monitoring, evaluating, and goal setting). The rest of the sessions (12 sessions) in EG1 were devoted to writing instruction. The second experimental group (EG2) experienced cooperative learning instruction for 6 sessions. First, they were randomly divided into 6 sub-groups, each group involved five students. Then they were assigned to collaborative activities. The researchers, following Slavin's (1996) cooperative learning principles, monitored everyone's participation in groups, each sub-group member's assignment, the within-group presentations, and participants' collaboration with each other in dealing with multifaceted tasks. The remaining 12 sessions were specified to writing instruction. Six sessions of metacognitive instruction and six sessions of cooperative training were incorporated for the third experimental group (EG3) and the 6 sessions left were used for writing instruction. The control group, on the other hand, received no metacognitive strategy instruction and cooperative instruction and followed the teacher's original course plan on writing.

Finally, all participants from the four groups were obliged to complete a post-test. To evaluate the students' performance on the posttest, the researchers invited two university instructors with 10 years of experience teaching English writing at the university level to score each essay using a grading criterion that goes up to 9 points. Before rating the papers, the two raters were asked to rate 50 papers and the inter-rater reliability between the raters was calculated (0.83, $p<0.001$).

3.5 Data Collection

The data collection procedure for this study followed a structured approach to systematically gather participants' responses to IELTS writing task II. The method aimed to collect authentic and meaningful data for a comprehensive analysis of metacognitive strategies, cooperative instruction, and metacognitive-cooperative instruction and their potential effect on Iranian EFL learners' performance on IELTS wring task II. For the metacognitive strategies, the researchers, following Veenman et al.'s (2006) research, enhanced Iranian EFL learners' metacognitive skills. In cooperative group, the researchers employed Slavin's (1996) cooperative learning principles to promote cooperative skills among EFL learners. In cooperative-metacognitive group, the researchers conducted metacognitive and cooperative skills for the third experimental group. Then the three experimental groups and one control group were required to take the same writing task. The collected papers were evaluated based on IELTS grading criteria by three experienced writing instructors. Participants were assured of the confidentiality of their responses and were given the freedom to withdraw from the study at any stage without repercussions. The random assignment aimed to prevent bias in task allocation and ensure fair representation across the four groups (experimental and control).

3.6 Data Analysis

To answer the research questions, the researcher conducted an ANCOVA analysis, utilizing the pretest results as the covariate. The researcher conducted the Kolmogorov-Smirnov test to check whether the data distribution was normal

for the pretest and posttest scores. For the mean comparison, the researchers used the nonparametric Wilcoxon-Singed Rank test.

4. Results

4.1 The Result of the Language Proficiency Test

OQPT was used to ensure that the participants had a similar level of ability in the English language. The table below presents the descriptive data for the OQPT.

Table 1. The descriptive statistics of the oxford placement test

	N	Minimum	Maximum	Mean	Std. Deviation
OPT	154	25.00	51.00	40.4481	5.48085
Valid N (listwise)	154				

Table 1 above shows the descriptive statistics of the OQPT. As can be seen in Table 1 above, the mean and the standard deviation of the participants were 40.44 and 5.48, respectively. Following the administration of the language proficiency exam, it was determined that out of the 154 participants, 120 individuals were classified as homogeneous members. This classification was based on their scores on the OQPT, which ranged from 37 to 47, indicating an upper-intermediate level of proficiency. The following table displays the descriptive statistics of the standardized participants.

Table 2. The descriptive statistics of the homogenized participants

	N	Minimum	Maximum	Mean	Std. Deviation
Homogenized	120	37.00	47.00	41.4750	2.90743
Valid N (listwise)	120				

As can be seen in Table 2 above, the mean and the standard deviation of the homogenized participants were 41.47 and 2.90, respectively.

4.2 Addressing the First Research Question

The primary question of this paper examined if cooperative instruction may yield any statistically significant impact on the enhancement of writing skills among Iranian EFL learners. Prior to conducting the research hypothesis test, it was imperative to verify the normality of the data distribution for the pretest and posttest scores. To accomplish this, the researcher performed the Kolmogorov-Smirnov test. The results are presented in Table 3.

Table 3. The Kolmogorov-Smirnov test of normality

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Cooperative_pre	.282	30	.000
Cooperative_post	.372	30	.000

Table 3 shows that the confirmation of data distribution's normality was not established, with a significance level of P< .05. Thus, the nonparametric Wilcoxon-Signed Rank test was employed to compare the means. Table 4 displays the statistical measures that describe the data.

Table 4. The descriptive statistics for the pretest/posttest of writing

	N	Minimum	Maximum	Mean	Std. Deviation
Cooperative_pre	30	3.00	5.00	4.0667	.90719
Cooperative_post	30	4.00	6.00	4.9000	.54772
Valid N (listwise)	30				

The above table shows that the mean of the posttest is more than the mean score of the pretest (4.90> 4.06). The following table displays the outcome of the Wilcoxon-Signed Rank test.

Table 5. Result of the Wilcoxon-Singed rank test for writing

	Cooperative_post - Cooperative_pre
Z	-3.542[b]
Asymp. Sig. (2-tailed)	.000

The Wilcoxon signed-rank test showed that there was a statistically significant difference between the pretest and posttest of the writing scores ($Z = -3.54$, $p < .05$). Consequently, the initial null hypothesis was refuted, indicating that cooperative instruction had a statistically significant impact on the enhancement of writing skills among Iranian EFL learners.

4.3 Answering the Second Research Question

Research question two examined if metacognitive education may yield any statistically significant impact on the enhancement of writing skills among Iranian EFL learners. Prior to conducting the research hypothesis test, it was imperative to verify the normality of the data distribution for both the pretest and posttest scores. To accomplish this, the researcher performed the Kolmogorov-Smirnov test. The results are presented in Table 6.

Table 6. The Kolmogorov-Smirnov test of normality

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Meta_pre	.208	30	.002
Meta_post	.379	30	.000

According to the information provided in Table 6, the data distribution did not meet the criteria for normality (P< .05). Thus, the nonparametric Wilcoxon-Signed Rank test was employed to compare the means. Table 7 shows the descriptive statistics.

Table 7. The descriptive statistics for the pretest/posttest of writing

	N	Minimum	Maximum	Mean	Std. Deviation
Meta_pre	30	2.00	5.00	4.0000	.87099
Meta_post	30	4.00	7.00	5.2333	.62606
Valid N (listwise)	30				

The above table shows that the mean of the posttest is more than the mean score of the pretest (5.23> 4). The next table shows the result of the Wilcoxon-Singed Rank test.

Table 8. Result of the Wilcoxon-Singed rank test for writing

	Meta_post - Meta_pre
Z	-4.198[b]
Asymp. Sig. (2-tailed)	.000

The Wilcoxon-signed rank test showed that there was a statistically significant difference between the pretest and posttest of the writing scores (Z = -4.19, p < .05). Consequently, the second null hypothesis was refuted, indicating that metacognitive teaching had a statistically significant impact on the enhancement of writing skills among Iranian EFL learners.

4.4 Answering the Third Research Question

The next question in this investigation examined if the implementation of Metacognitive-cooperative instruction could yield any statistically significant impact on the enhancement of writing skills among Iranian EFL learners. Prior to conducting the research hypothesis test, it was imperative to assess the normality of the data distribution for both the pretest and posttest scores. To accomplish this, the researchers performed the Kolmogorov-Smirnov test. The results are presented in Table 9.

Table 9. The Kolmogorov-Smirnov test of normality

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Meta_Cop_Pre	.272	30	.000
Meta_Cop__Post	.217	30	.001

According to Table 9, the data distribution did not meet the criteria for normalcy (P< .05). Hence, the nonparametric Wilcoxon-Signed Rank test was employed to compare the means. The descriptive data are presented in Table 10.

Table 10. The descriptive statistics for the pretest/posttest of writing

	N	Minimum	Maximum	Mean	Std. Deviation
Meta_Cop_Pre	30	2.00	5.00	3.9333	1.08066
Meta_Cop__Post	30	5.00	7.00	5.9667	.80872
Valid N (listwise)	30				

The above table shows that the mean of the posttest is more than the mean score of the pretest (5.96> 3.93). The following table displays the result of the Wilcoxon-Signed Rank test.

Table 11. Result of the Wilcoxon-Singed rank test for writing

	Meta_Cop__Post - Meta_Cop_Pre
Z	-4.455[b]
Asymp. Sig. (2-tailed)	.000

The Wilcoxon signed-rank test showed that there was a statistically significant difference between the pretest and posttest of the writing scores (Z = -4.55, p < .05). Therefore, the third null hypothesis was rejected, meaning that metacognitive-cooperative training had a statistically significant impact on Iranian EFL learners' writing improvement.

4.5 Answering the Fourth Research Question

The fourth research question of this study investigated whether there was any statistically significant difference among the effect of metacognitive, cooperative, and metacognitive-cooperative instruction on Iranian EFL learners' writing improvement. To address this study inquiry, the researcher conducted an ANCOVA analysis, considering the pretest results as the covariate. The table below displays the descriptive statistics for the writing scores of both groups.

Table 12. The descriptive statistics for the adjusted mean scores of writings

			95% Confidence Interval	
Group_CE	Mean	Std. Error	Lower Bound	Upper Bound
control	4.210[a]	.131	3.949	4.470
cooperative	4.887[a]	.131	4.627	5.147
metacognitive	5.241[a]	.131	4.981	5.501
metacognitive-cooperative	5.996[a]	.131	5.735	6.256

The mean scores for the control, cooperative, metacognitive, and metacognitive-cooperative groups are 4.21, 4.88, 5.24, and 5.99, respectively. The next table shows the result of the inferential test.

Table 13. The result of ANCOVA for the comparison between the two groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	57.701[a]	4	14.425	27.897	.000	.492
Intercept	91.793	1	91.793	177.518	.000	.607
Prescores	10.934	1	10.934	21.146	.000	.155
Group_CE	49.576	3	16.525	31.958	.000	.455
Error	59.466	115	.517			
Total	3218.000	120				
Corrected Total	117.167	119				

As Table 13 shows, there was a statistically significant difference among the four groups regarding their writing scores, F (3, 115) = 31.95, $p < .05$, partial $\eta^2 = .45$. Hence, the fourth null hypothesis is rejected. To find out where the difference lies, the researcher conducted a pairwise comparison test.

Table 14. The result of the pairwise comparison following the inferential test

					95% Confidence Interval for Difference[b]	
(I) Group_CE	(J) Group_CE	Mean Difference (I-J)	Std. Error	Sig.[b]	Lower Bound	Upper Bound
control	cooperative	-.677*	.186	.002	-1.176	-.179
	metacognitive	-1.032*	.186	.000	-1.531	-.533
	metacognitive-cooperative	-1.786*	.186	.000	-2.286	-1.287
cooperative	control	.677*	.186	.002	.179	1.176
	metacognitive	-.355	.186	.353	-.853	.144

	metacognitive-cooperative	-1.109*	.186	.000	-1.608	-.610
Metacognitive	control	1.032*	.186	.000	.533	1.531
	cooperative	.355	.186	.353	-.144	.853
	metacognitive-cooperative	-.755*	.186	.001	-1.253	-.256
metacognitive-cooperative	control	1.786*	.186	.000	1.287	2.286
	cooperative	1.109*	.186	.000	.610	1.608
	metacognitive	.755*	.186	.001	.256	1.253

As can be seen in the above table, all the experimental groups were statistically better than the control group ($p < .05$); the metacognitive-cooperative group was statistically better than the three other groups ($p < .05$). However, the study did not find any statistically significant distinction between the cooperative and metacognitive groups ($p > .05$). Following the descriptive statistics in Table 12, we can conclude that the fourth null hypothesis is rejected, putting emphasis on the effectiveness of the experimental groups, and proving the superiority of the metacognitive-cooperative group.

5. Discussion

This study aimed to investigate the effect of metacognitive-cooperative instruction among Iranian EFL learners on writing improvement in institutes. Having analyzed the obtained results, the researchers figured out the effectiveness of metacognitive-cooperative instruction on learners writing improvement. The data analysis revealed a significant correlation between metacognitive-cooperative instruction and writing improvement of learners. This relationship was verified through various statistical measures, including The Wilcoxon signed-rank test and pairwise comparison test, and the results were compared using the ANCOVA analysis.

5.1 Cooperative Instruction and Writing

Based on the findings of the research, it was observed that cooperative instruction exhibited a substantial positive correlation with the enhancement of writing skills among Iranian EFL learners. The results presented in this study align with prior research undertaken in this specific field (e.g., Ahangari & Samadian, 2014; Ahmadi, Motallebzade, & Fatemi, 2014; Soleimani & Modirkhamene, 2020). Yusuf, Jusof, and Yusuf (2019) also investigated the effects of cooperative learning to improve the writing skills of 9th grade students in middle school in Kula Lumpurr. They used quasi-experimental design with pre-test and post-test of the narrative essays as instruments. The writings were scored on five writing components including vocabulary, organization, grammatical accuracy, and mechanics. The results showed that the students' scores increased from pretest to posttest after the application of cooperative learning strategies. Furthermore, the present study's results are consistent with those reported by Ghorbani (2008), who conducted a study examining the impact of cooperative instruction on the writing proficiency of Iranian students who were studying English as a second language. According to Ghorbani's findings, cooperative instruction was determined to be a superior pedagogical approach in comparison to conventional approaches, leading to enhanced educational achievements.

5.2 Metacognitive Instruction and Writing

In reference to the second research inquiry, the investigation additionally revealed a noteworthy favorable association between metacognitive training and the enhancement of writing skills among Iranian EFL learners. The findings of Al-Jarrah, Mansor, and Rashid's (2018) study are corroborated by these results, indicating that the utilization of metacognitive training is a viable approach to enhance learning and improve writing skills. In a similar vein, the results of the study corroborated the conclusions drawn by Bavand Savadkouhi and Zekavati (2014), who demonstrated that the instruction of metacognitive methods can yield a substantial enhancement in students' writing proficiency. In a separate study conducted by Pitenoee, Modaberi, and Ardestani (2017), an investigation was carried out to explore the impact of cognitive and metacognitive methods on the writing abilities of upper-intermediate students in Iran. The participants of the research were allocated into three distinct groups, consisting of one control group and two experimental groups. The two experimental groups received cognitive and metacognitive strategy instruction for the writing drills. In contrast, the control group was not provided with any instruction or guidance regarding writing strategies. The findings of the study indicated that the writing proficiency of the experimental groups improved following the implementation of writing strategy education. Furthermore, the findings of this study indicate that the

group utilizing metacognitive strategies exhibited superior performance compared to the group employing cognitive strategies in terms of content generation in writing tasks.

Nevertheless, the findings of this study diverge from the research conducted by Azizi, Nemati, and Estahbanati (2017), which concluded that metacognitive methods, including planning, monitoring, and self-awareness, had no significant impact on students' writing proficiency. The study conducted by the researchers was to investigate the utilization of metacognitive methods in writing among Iranian EFL learners and its impact on their writing proficiency. According to Dobson and Dobson (2016), existing data suggests that metacognition training has a beneficial effect on writing. However, it is important to note that not all metacognitive experiences result in improved written communication. The results of the study conducted by Maftoon, Birjandi, and Farahian (2014) indicated the presence of instances where novice learners exhibited an understanding of the cognitive processes involved in writing yet struggled to effectively monitor and regulate these processes. The superior performance exhibited by proficient writers in this study, among other contributing variables, may be related to their adeptness in regulating skills.

5.3 Metacognitive-cooperative Instruction and Writing

The study revealed that metacognitive-cooperative instruction significantly correlated with Iranian EFL learners' writing improvement. These findings align with a study conducted by Teng (2020c), which revealed that students who were taught via metacognitive-cooperative education had superior writing performance compared to those who received either cooperative learning or metacognitive instruction in an individual setting. Teng and Huang (2021) investigated the effects of metacognitive instruction and collaborative writing on the linguistic features of complexity, accuracy, and fluency. The study included four cohorts of Chinese tertiary level EFL students who received metacognitive education in either a collaborative writing environment (n=84) or an individual setting (n=88) or engaged in collaborative writing (n=96) or individual writing (n=81). The MANCOVA results indicated that the combination of metacognitive education and collaborative writing had a beneficial impact on writing correctness, while it did not have a significant effect on fluency and complexity. The findings are corroborated by Pesout and Nietfeld (2021), who conducted a study involving 84 sixth-grade students. Their research emphasized the significance of social interaction in improving metacognitive processes and students' performance outcomes.

6. Conclusion

This study examined the effects of metacognitive cooperative education on the enhancement of writing skills in Iranian EFL learners. The results indicated that the experimental groups achieved better performance compared to the control group. The results also indicated that the integration of metacognitive and cooperative learning resulted in greater performance compared to the groups that only received instruction in either cooperative or metacognitive methods. This study offers some practical implications. Firstly, the study found that metacognitive-cooperative instruction helped students develop their metacognitive awareness, which enabled them to regulate their learning processes and improve their writing skills. Therefore, the pedagogical implications of this study suggest that EFL teachers should incorporate metacognitive-cooperative instruction in their writing classes to enhance students' writing skills and metacognitive awareness. Teachers can use various strategies such as peer feedback, group discussion, and reflective writing to promote metacognitive-cooperative learning in their classrooms. Additionally, teachers can provide explicit instruction on metacognitive strategies such as planning, monitoring, and evaluating to help students become more effective writers.

Secondly, it was found that EFL students struggled with achieving metacognitive knowledge. This means they may need help understanding how they learn or think about their learning process. To address this, teachers should provide structured instruction on metacognitive skills. This entails assisting students in discerning various forms of knowledge associated with learning methodologies and acknowledging the merits and limitations of those tactics. Students should also apply these skills to understand their unique learning styles and preferences better. Thirdly, teaching writing can be challenging for language instructors. However, our study has revealed that utilizing metacognitive knowledge and strategies, as well as implementing cooperative instruction by dividing students into smaller groups, can significantly facilitate the teaching process. This approach allows students to learn from one another and makes the teachers' job much more manageable. By combining collaborative and metacognitive learning, students can acquire the necessary skills to effectively express their thoughts in writing.

Finally, investigating the efficacy of metacognitive-cooperative instruction in enhancing EFL writing skills, this study offers valuable insights for educators and curriculum developers seeking to optimize their teaching methods and improve student outcomes. Moreover, the study underscores the importance of metacognition in the writing process, highlighting the need for students to develop self-awareness and self-regulation skills to become more effective writers. Ultimately, this study has far-reaching implications for EFL education, providing a promising approach to enhancing students' writing proficiency and preparing them for academic and professional success. Since improving students' writing ability is one

of the main concerns of EFL teachers and cooperative and metacognitive strategies techniques facilitate the writing process, further research is required to have a thorough comprehension of the possible impact of metacognitive-cooperative training on various levels of language proficiency. Moreover, it seems essential to investigate the impact of metacognitive-cooperative instruction on discourse and linguistic features.

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