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Research Article

Comparing the Impact of Homogeneous Versus Heterogeneous Pairing Types on Iranian High and Low Proficiency EFL Learners' Writing Accuracy and Fluency

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ABSTRACT

The current study examined the impact of homogeneous versus heterogeneous pairing types on Iranian high and low proficiency EFL learners' writing accuracy and fluency. A total of 92 Iranian EFL learners, classified as high (H) or low (L) proficiency based on the Oxford Quick Placement Test (OQPT), were randomly assigned into three experimental groups: one heterogeneous group (H-L pairs, n=32) and two homogenous groups (H-H pairs, n=30 & L-L pairs, n=34). Following the pretest, collaborative writing tasks were conducted within homogeneous and heterogeneous pairs during the treatment phase, followed by a posttest. The accuracy and fluency of the compositions were assessed using the proportion of error-free T-units to the total T-units and the average number of words per T-unit in a text, respectively. The results of a two-way multivariate analysis of covariance, univariate tests, and post-hoc comparisons revealed that different pairing types did not yield any significant difference in the writing accuracy of high proficiency learners. However, a significant difference was observed in their writing fluency. Furthermore, significant differences in writing accuracy and fluency were found between the homogeneous L-L and heterogeneous H-L groups among low proficiency learners. The study's findings hold strong theoretical and pedagogical implications, providing valuable insights for EFL educators and other stakeholders in the education sector.

Introduction

The ability to write accurately and fluently in English is becoming increasingly important in today's modern world since communication through English has become more and more prevalent. Writing is one of the most tangible of the four language skills through which ideas are created and expressed by employing the individual's linguistic resources. It therefore offers teachers insight into the linguistic knowledge of their learners. In addition, writing is a generally difficult skill because it is not a spontaneous activity but has to be learned. Particularly, being able to write English fluently and accurately to cope with the growing communicative and academic demands in the classroom context or other formal situations is one of the major aims of English as a foreign language (EFL) learners (Jee & Aziz, 2021; Manegre & Gutiérrez-Colón, 2020). However, many EFL teachers find it difficult to get learners to express their meanings in English because EFL learners, due to their cultural background and lack of extensive vocabulary and an accurate model, cannot use English easily to communicate meaning, especially in written form (Indrilla & Ciptaningrum, 2018; Veramuthu & Shah, 2020). Particularly, Iranian EFL context presents a unique challenge to the development of productive language skills, especially writing. This challenge is the result of the limited opportunities for authentic interaction in the Iranian EFL context because in Iran, where English is not the medium of communication in daily life, EFL students encounter fewer naturalistic settings to practice English (Rajablou & Shirvan, 2017). Hence, learning to write is an inseparable part of language learning, and more and more attention has been, and still should be, drawn to developing writing skills in the EFL teaching field (Ong & Zhang, 2010; Zamani, 2016).

Furthermore, language accuracy and fluency are two important components of language proficiency that are required for effective communication. Accuracy refers to the correctness of language, focusing on grammar, vocabulary, and pronunciation. It helps learners convey their message without any distortion of meaning and misunderstanding as a result of errors. On the other hand, fluency focuses on the quality of communication of thoughts in the target language smoothly and effortlessly (Biria & Jafari, 2013; Soleimani et al., 2015; Wigglesworth & Storch, 2009). In the EFL context, particularly, it takes lots of time and practice for EFL learners to become accurate and fluent in their productive skills, like writing, and it is something that is developed through various steps and techniques. For EFL learners, developing accuracy and fluency in English writing is necessary for global written communication and achieving academic as well as professional opportunities. Alongside the traditional activities such as grammar exercises, definitions, and repeated drills, EFL teachers can apply other innovative techniques, such as collaborative learning, to provide more opportunities for communicative language use and to help EFL learners enhance their autonomy and confidence to collaboratively improve their language accuracy and fluency, especially in writing skill (Derakhshan & Shirmohammadli, 2015; Moqadasizadeh et al., 2023).

Consequently, the interest in a more communicative approach to EFL teaching has resulted in the growth of collaborative learning techniques, namely pair work, whose positive consequences in EFL instruction have been predominant (Dobao & Blum, 2013; Storch, 2001; Susant et al., 2020). Pair-work activities stimulate learners to provide opportunities for natural language use, negotiate meaning, and feel less anxious and more confident, leading them to better academic outcomes (Namaziandost et al., 2020; Wigglesworth & Storch, 2009). This phenomenon,

grounded in Vygotsky's socio-cultural theory (SCT), emphasizes the supporting role of interaction in language learning. According to SCT, focusing on constructivist learning principles, learning is a socially constructed activity, and interaction with others can mediate the learners' cognitive development. This suggests that with assistance from peers, a learner can achieve more than what is possible independently. Therefore, as learners collaborate on foreign language tasks, they pool their linguistic resources to address their language challenges (Johnston et al., 2000; Neumann & McDonough, 2015; Storch, 2001).

Considering that collaborative pair work has long been recognized as an effective communicative practice in EFL classrooms, a crucial question remains regarding the optimal method for creating the pairs. In other words, one of the main concerns of teachers who implement collaborative pair work activities is how to best pair students for the best scaffolding and learning outcome. In addition, researchers in the EFL teaching field are interested in finding out the best pair or group composition to maximize learning outcomes (Alfino et al., 2022; Biria & Jafari, 2013; Shehadeh, 2011). Language proficiency has been suggested as an effective criterion for forming pairs by many researchers (e.g., Adodo & Agbayewa, 2011; Baer, 2003; Maftoon & Ghafoori, 2009; Storch & Aldosari, 2012; Susanti et al., 2020; Watanabe & Swain, 2007). Accordingly, based on their overall language proficiency, EFL learners can be paired homogenously, High-High (H-H) and Low-Low (L-L), or heterogeneously, High-Low (H-L) (Alfino et al., 2022; Dobao & Blum, 2013; Zabihi & Rezazadeh, 2013).

Now, the question arises whether these two different scaffolding conditions have different outcomes in the acquisition of language skills, specifically writing accuracy and fluency, or not. Therefore, the study aimed to investigate whether the collaboration in the two different pairing types (i.e., homogeneous vs. heterogeneous pairing) showed any effect on high and low proficiency EFL learners' writing accuracy and fluency.

Literature Review

The majority of the previous studies have focused on the comparison between the effect of individual versus group work on writing ability (e.g., Tavakoli & Rezazadeh, 2014; Villarreal & Gil-Sarratea, 2019; Wigglesworth & Storch, 2009), examining the role of collaborative writing on general writing ability (e.g., Fauziah & Latief, 2015; Li & Liu, 2022; Maftoon & Ghafoori, 2009), and examining collaborative writing on only writing fluency (e.g., Biria & Jafari, 2013; Hora, 2019) or writing accuracy (e.g., Jafari & Nejad-Ansari, 2012; Meihami et al., 2013; Moqadasizadeh et al., 2023; Sang & Zou, 2022).

More particularly, some of the studies reported that pair work can significantly foster learners' writing accuracy (e.g., Jafari & Nejad-Ansari, 2012; Jalili & Shahrokhi, 2017; Meihami et al., 2013; Soleimani et al., 2015; Moqadasizadeh et al., 2023; Sarkhosh & Najafi, 2019; Storch, 2005, Wigglesworth & Storch, 2009; Zabihi & Rezazadeh, 2013), some others reported the insignificant effect of collaborative pair work on developing writing accuracy (e.g., Kuiken & Vedder, 2002; Storch, 2007). In addition, while some research suggested the positive effect of collaborative pair work on developing learners' writing fluency (e.g., Soleimani et al., 2015; Sarkhosh & Najafi, 2019), others pointed to the inefficiency of collaborative writing in boosting learners' writing fluency (e.g., Biria & Jafari, 2013; Jalili & Shahrokhi, 2017; Storch, 2005; Wigglesworth & Storch, 2009; Zabihi & Rezazadeh, 2013).

Referring to the effectiveness of different proficiency pairings, Kim and McDonough (2008). Storch and Aldosari (2012) and Zabihi and Ghahramanzadeh (2022) revealed that homogenous pairs generated more language-related episodes than heterogeneous counterparts. They found that heterogeneous pairs worked less efficiently, possibly because the peers had different needs within their ZPDs and they could not respect each other's perspectives. Thus, proponents of homogeneous grouping (e.g., Adodo & Agbayewa, 2011; Kim & McDonough, 2008; Storch & Aldosari, 2012; Zabihi & Ghahramanzadeh, 2022) believe that this type of grouping helps high proficiency learners progress with a faster rate without being impeded by the slower learning pace of other students.

On the contrary, some other studies (e.g., Fakher Ajabshir & Panahifar, 2020; Kuiken & Vedder, 2002; Wu, 2008) found evidence to support the outperformance of heterogeneous pairs in the negotiation of meaning leading to language learning. Hence, the proponents of heterogeneous pairing (e.g., Wu, 2008) simulate the classroom environment as a realistic work environment. They argue that once students enter the workplace, they will be required to collaborate with individuals of different ages, abilities, and aptitudes. They claim that low-ability and average-ability students benefit from heterogeneous peer interaction, and high-ability students can also reinforce their learning by teaching others. Moreover, Johnson and Johnson (2009) and Mahenthiran and Rouse (2000) suggested that in heterogeneous grouping, more proficient students who have already internalized certain knowledge demonstrate it, while less proficient students strive to internalize that knowledge. Thus, both more and less proficient learners benefit from this interaction.

Considering the performance of high and low proficiency learners, Susanti et al. (2020) revealed that both high and low proficiency students who experienced collaborative writing in homogenous proficiency pairings have better writing ability than those who experienced collaborative writing in heterogeneous proficiency pairings. Hence, pair collaboration can foster language learning more efficiently when there are no large proficiency gaps among pairs. On the other hand, Adodo and Agbayewa (2011), Smieja (2012), and Kian-sam (1999) show that only high proficiency learners benefit from the homogeneous group, while average and low ability students performed better in heterogeneous groups. It is believed that high proficiency learners maintain their interest and motivation in homogeneous groups, but when grouped with low proficiency learners, their competence declines.

Consequently, prior studies have yielded inconsistent findings regarding the superiority of one approach over the other among high and low proficiency learners (e.g., Fauziah & Latief, 2015; Maftoon & Ghafoori, 2009). Moreover, this problem has not been adequately addressed regarding its role in developing English writing accuracy and fluency in Iranian EFL context. Therefore, in order to address the recognized gap, the study aimed to answer the following research questions.

RQ1. Does high proficiency EFL learners' collaboration in H-H versus H-L pairs have any significant differential effect on their writing accuracy?

RG2. Does low proficiency EFL learners' collaboration in L-L versus H-L pairs have any significant differential effect on their writing accuracy?

RQ3. Does high proficiency EFL learners' collaboration in H-H versus H-L pairs have any

significant differential effect on their writing fluency?

RQ4. Does low proficiency EFL learners' collaboration in L-L versus H-L pairs have any significant differential effect on their writing fluency?

Method

Participants

The initial participants of this study were 102 Iranian female EFL learners aged 14-18 enrolled at Milad Language Institute in Pars Abad, Iran. They were selected out of the body of 210 EFL learners already placed by the institute's administration at different levels of intermediate, upper-intermediate, and advanced. The reason for adopting the different proficiency levels was to have access to an adequate number of high (H) and low (L) proficiency EFL learners. Thus, the participants of this study were selected by purposive sampling according to their language proficiency levels.

Based on the results of the Oxford Quick Placement Test (OQPT), two levels of proficiency (i.e., H & L) were identified. Next, the participants took a pretest to determine the initial level of their writing accuracy and fluency. Based on the results, a small number of the participants who did not meet the proficiency criteria were excluded. Consequently, 96 participants remained for the study. They were assigned to three experimental groups, that is one heterogeneous group comprising H-L pairs (n=32) and two homogeneous groups consisting of H-H pairs (n=30) and L-L pairs (n=34).

Instruments

In this study, the following instruments were used for data collection.

Oxford Quick Placement Test (OPT)

The *Oxford Quick Placement Test (OQPT) was administered initially to check the participants'* current English proficiency levels to divide them into high and low proficiency EFL learners. OQPT is easy to administer as well as practical for grading students into different levels of proficiency (Edwards, 2007). It has 60 multiple-choice questions measuring learners' knowledge of grammar, vocabulary, and writing ability. Further, the reliability and construct validity of this test have been confirmed by many studies (e.g., Abbasi Dogolsara et al., 2022; Jalili & Shahrokhi, 2017; Tavakoli & Rezazadeh, 2014). However, for the current study, OQPT was piloted using a similar and small sample size, and its internal reliability was calculated by Cronbach's alpha coefficients (α = 0.80), indicating an acceptable level of reliability estimate. Moreover, a panel of experts confirmed its validity.

IELTS General Writing Task 2

The topics presented in IELTS General Writing Task 2 (Appendix A), developed by Cambridge University, were employed in the pretest, posttest, and throughout the treatment period, requiring learners to write a composition in response to a statement or question. The rationale for using this task was that it is an internationally employed English assessment, and the topics are suitable for learners with different proficiency levels, from low to high. The selected topics included education, friends and families, art, TV, and media, all of which seemed to be interesting for participants within their age range. Each topic, in the form of a question, motivated learners to engage in collaborative discussions to develop ideas and express their thoughts as clearly, fluently, and accurately as possible.

Moreover, the rationale for the utilization of the writing composition task, modeled by Maftoon and Ghafoori (2009), Nosratinia and Razavi (2016), and

Susant et al. (2020), was the belief that composition writing fosters cognitive activity, creativity, and critical thinking. This method is regarded as a productive tool to use language meaningfully and integrate mental ideas into a cohesive and assessable outcome (Jalili & Shahrokhi, 2017).

To assess the topics' effectiveness, two topics were randomly chosen and piloted with ten learners who were similar to the participants in terms of age and proficiency level. The inter-rater reliability results about the difficulty level of the writing topics demonstrated a satisfactory reliability measure (r = 0.79). Further, five experts confirmed the test's content validity.

Design and Procedures

This quantitative quasi-experimental research examined the causal relationship between homogeneous versus heterogeneous pairing types on Iranian high and low proficiency EFL learners' writing accuracy and fluency. Thus, the dependent variables of this study included Iranian EFL learners' writing accuracy and fluency. The independent variable included pairing types (i.e., homogeneous vs. heterogeneous pairings). Additionally, since the pairing method was conducted based on the participants' proficiency levels, the participants' proficiency level (H & L) was considered a moderating variable in this study. This moderator variable was used to examine whether the effect of pairing type on writing accuracy and fluency depends on learners' proficiency level or not.

Before conducting the main study, a pilot study was carried out to precisely assess the quality of the topics and OQPT using inter-rater reliability and content validity. Moreover, the time needed for each composition writing and any potential issues encountered during the collaborative writing task were recognized.

Initially, all 210 EFL learners took OQPT, and according to the results, 102 learners who scored between one and three standard deviations (SD) above and below the mean score were selected to participate in this study. The participants within one to three SD above the mean score (with OQPT score of 47-55) were labeled as high proficiency learners (H, n = 50) and the participants within one to three SD below the mean score (with OQPT score of 27-31) were labeled as low proficiency learners (L, n = 52). The rationale for not involving the participants within one SD above and below the mean was to widen the gap between the high and low learners.

Having categorized the participants into high and low proficiency learners, a pretest was given to them to establish their initial level of writing accuracy and fluency. A 50-minute time, which was determined by a pilot study, was allocated for task completion. The participants were instructed to write a composition on a topic randomly selected from the list of topics in IELTS General Writing Task 2, as follows.

"Some people think that teaching children at home is best for their development, while others believe that it is essential for children to go to school. Discuss the advantages of both methods and give your own idea. Work with your partner to write a composition on this topic."

After the pretest, the 96 participants who met the required criteria were randomly assigned to three experimental groups that is the heterogeneous group including H-L pairs (n = 32), and the homogeneous groups containing H-H pairs (n = 30) and L-L pairs (n = 34).

During the treatment period, each of the groups engaged in pair-work activities which were specifically designed to enhance writing accuracy and fluency. Participants of the heterogeneous group collaborated with peers with different proficiency levels, while the participants in the

homogeneous group worked with peers with similar proficiency. First, the researcher, as a teacher, explained the concept of collaborative writing and emphasized that it required active engagement and joint contributions rather than merely sitting together in pairs. This explanation included examples of effective collaborative behaviors, such as brainstorming ideas, discussing grammatical structure, as well as doing collaborative revisions to produce a shared composition. Additionally, the classroom setting was rearranged to encourage better pair collaboration.

Then, in each session, one topic was presented to them. Before performing collaborative writing tasks in the treatment process, an informal oral opinion poll was conducted about each topic to confirm that participants had sufficient knowledge about the topic. The poll involved asking open-ended questions to check the participants' familiarity and interest. If a topic was identified as unsuitable according to the participants' responses, it would be replaced with another topic to ensure more meaningful collaborations. Then, the participants were asked to brainstorm their ideas with their peers in pairs, produce an initial draft, and, after reviewing together, produce a final shared composition for 50 minutes. During this time, the teacher actively circulated the classroom, monitored the paired interactions, and provided guidance when needed to ensure that both peers contributed equally. To elicit enough data, the students were required to write at least two paragraphs. In the end, the written compositions were collected, corrected by the teacher using the same criteria applied in the pretest and posttest (as mentioned in the next section). Then, corrected compositions were returned to each pair in the next session. The pairs were asked to examine their jointly produced compositions regarding the teacher's comments and collaboratively revise the previous session's written task before starting the new composition.

After the treatment period of 15 sessions twice a week, the participants completed a posttest, which was a modified version of the pretest. The purpose was to measure the progress in accuracy and fluency of writing, while maintaining consistency of task:

"Some argue that homeschooling by parents or caregivers offers the best support for a child's development. Others believe that attending school and receiving a formal education is crucial for a child's growth. Discuss the advantages of both methods and give your own idea. Work with your partner to write a composition on this topic."

Then, two raters (the researcher & her colleague) sequentially examined and scored 72 written compositions according to a selected objective scoring scale for measuring writing accuracy and fluency. Finally, the inter-rater reliability between two sets of scores by the examiners was computed and confirmed for both writing accuracy ($r = 0.89$) and fluency ($r = 0.84$) by the Pearson correlation coefficient. Besides, the intra-rater reliability between the researcher's first scoring and her scoring after a two-week interval revealed an acceptable value for both writing accuracy ($r = 0.95$) and fluency ($r = 0.93$).

Scoring Scale for Measuring Writing Accuracy and Fluency

To measure the accuracy of the compositions written in the posttest, following Larsen-Freeman (2006), Polio (1997), and Nosratinia and Razavi's (2016) established guidelines for T-units and error analyses, the researcher utilized the rubric of the ratio of the error-free T- T-units to the total T-units. Modeled by Tavakoli and Rezazadeh (2014), the counted errors in this study included syntactical errors (e.g., mistakes in word order & missing elements) and morphological errors, including verb

tense issues, subject-verb agreement, and incorrect use of articles and prepositions, as well as errors in word forms. The errors in word choice were counted only if they disrupted the meaning. Additionally, errors of spelling and punctuation were excluded from the analysis because while these elements are important for overall writing quality, their exclusion allowed for a narrower focus on morpho-syntactic structures.

In addition, to measure the fluency of the written compositions, the rubric for measuring writing fluency adopted by Larsen-Freeman (2006), Nosratinia and Razavi (2016), and Storch and Wigglesworth (2007) was used in this study, which is the average number of words per T-units in a composition. Thus, in this study, the unit of analysis was a T-unit, which is defined as one main clause plus whatever subordinate clauses are attached to or embedded within it (Nosratinia & Razavi, 2016).

Data Analysis

After obtaining the results of descriptive statistics, a two-way multivariate analysis of covariance (two-way MANCOVA) was conducted to determine the effect of homogeneous versus heterogeneous pairing types on the combination of writing accuracy and fluency, considering the pretest scores as covariates, moderated by high and low proficiency levels. This method was appropriate because it controls Type I error by examining group differences in terms of multiple factors that might be correlated. When significant results of MANCOVA were found, univariate analyses were performed to examine each factor separately. Finally, post-hoc analyses provided more detailed comparisons.

Results

Descriptive statistics of the pretest scores of writing accuracy and fluency for high and low proficiency learners are reported in Table 1.

Table 1

Pretest Writing Accuracy and Fluency Scores

	N	Measure	Mean	SD	Range
High proficiency learners	50	Accuracy	0.65	0.009	0.6-0.85
		Fluency	10.8	1.5	10-15
Low proficiency learners	52	Accuracy	0.38	0.11	0.3-0.5
		Fluency	9.1	1.6	8-10

Table 1 shows that high proficiency learners obtained higher mean scores at both writing accuracy and fluency compared to low proficiency participants. Posttest results after assignment of the high and low proficiency participants to homogeneous versus heterogeneous pairing groups are presented in Table 2.

Table 2

Posttest Descriptive Statistics

Group Type	Proficiency Level	Measure	Mean	SD	Range
H-H	High	Accuracy	.72	.07	.69 - .9
		Fluency	13.2	1.3	12 - 17
H-L	High	Accuracy	.71	.08	.65 - .85
		Fluency	12.7	1.4	11 - 16
L-L	Low	Accuracy	.41	.09	.35 -.5
		Fluency	10	1.1	8 - 12

Group Type	Proficiency Level	Measure	Mean	SD	Range
L-H	Low	Accuracy	.63	.09	.55 -.75
		Fluency	11.50	1.25	9 - 14

Table 2 shows that the scores of both accuracy and fluency were enhanced for all groups from the pretest to the posttest. Before doing inferential statistics to examine the significant differences, the Kolmogorov-Smirnov test was used to check the normality of the distribution of accuracy and fluency scores of the four groups. The results indicated that the significance levels for high proficiency learners in both homogeneous (H- H, p = 0.38, p = 0.60) and heterogeneous (H-L, p = 0.79, p = 0.55) groups, and for low proficiency learners in both homogeneous (L-L, p = 0.11, p = 0.79) and heterogeneous (H-L, p = 0.56, p = 0.51) groups, all exceeded 0.05, confirming the normal distribution of accuracy and fluency scores for the four groups in both homogeneous and heterogeneous pairings.

Then, a two-way multivariate analysis of covariance (MANCOVA) was conducted to examine the effects of pairing types (homogeneous vs. heterogeneous) on writing accuracy and fluency scores of Iranian EFL learners, by controlling the initial differences in pretest, moderated by the high and low proficiency levels (Table 3).

Table 3

MANCOVA Results for Writing Accuracy and Fluency

Effect	Pillai's Trace	F	df1	df2	p	Partial Eta Squared
Proficiency Level	0.62	23.45	2	74	.000	.38
Pair Type	0.48	16.56	2	74	.000	.30
Proficiency Level × Pair Type	0.13	5.65	2	74	.005	.13

According to Table 3, there was a significant multivariate effect of proficiency level ($p < 0.001$), which means that the writing performance of high and low proficiency learners was significantly different. Moreover, pair type had a significant multivariate effect ($p<0.001$), indicating that the type of pairing could significantly influence learners' writing performances. Further, the interaction between proficiency level and pair type was significant ($p=0.005$), confirming that the effect of the pairing type varied depending on learners' proficiency. Then, following the significant multivariate results, the univariate analysis was conducted to examine the effects on each dependent variable, separately (Table 4).

Table 4

Univariate Tests of Between-Subjects Effects

Measure	Source	Type III Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Accuracy	Proficiency Level	.19	1	.19	29.73	.000	.29
	Pair Type	.25	1	.25	38.5	.000	.32
	Interaction	.08	1	.08	13.0	.001	.10
Fluency	Proficiency Level	14.62	1	14.62	26.04	.000	.26

Measure	Source	Type III Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
	Pair Type	5.83	1	5.83	10.33	.002	.12
	Interaction	4.41	1	4.41	7.77	.008	.09

According to Table 4, both writing accuracy and fluency were significantly influenced by learners' proficiency level ($p < 0.001$). Moreover, the pair type affected both writing accuracy ($p < 0.001$), and fluency ($p = 0.002$), significantly. Further, the interaction effects for writing accuracy ($p = 0.001$) and fluency ($p = 0.008$) were significant, thus the effect of pairing type was not uniform across proficiency levels. In addition, in order to explore where these differences lie, post-hoc comparisons were conducted for both writing accuracy and fluency.

Post-Hoc Comparisons for Writing Accuracy

According to Table 5, high proficiency learners of homogeneous (H-H) and heterogeneous (H-L) pairs revealed no significant difference in accuracy scores ($p = 0.86$). However, low proficiency learners in heterogeneous pairs (H-L) revealed significantly higher accuracy scores than in homogeneous pairs (L-L, $p = 0.002$).

Table 5

Post-Hoc Comparisons for Writing Accuracy

Comparison	Mean Difference	Standard Error	p-value	95% Confidence Interval
H-H vs. H-L	.01	.03	.86	[- .06, .089]
L-L vs. H-L	- .22	.029	.002	[- .358, - .082]

Post-Hoc Comparisons for Writing Fluency

Table 6 reveals that high proficiency learners in homogeneous pairs (H-H) demonstrated significantly higher fluency scores than those in heterogeneous pairs (H-L, $p = 0.003$). However, low proficiency learners in heterogeneous pairs (H-L) obtained significantly higher scores than those in homogeneous pairs (L-L, $p = 0.001$).

Table 6

Post-Hoc Comparisons for Writing Fluency

Comparison	Mean Difference	Standard Error	p-value	95% Confidence Interval
H-H vs. H-L	.50	.12	.003	[.18, .82]
L-L vs. H-L	-1.50	.15	.001	[-1.86, -1.14]

Discussion

The current study attempted to determine if homogeneous versus heterogeneous pairing types had any significant effect on high and low proficiency EFL learners' writing accuracy and fluency. The statistical analysis results are further discussed, referring to each research question.

Homogeneous versus Heterogeneous Pairing Type on High Proficiency Learners' Writing Accuracy

To answer the first research question, the results revealed that homogeneous versus heterogeneous pairing types did not have any significant differential effect on Iranian high proficiency EFL learners' writing accuracy, thus the effects of both types of pairing on high proficiency learners were very similar. In other words, high proficiency learners in both groups improved their writing accuracy. This finding is partly in line with the results of Cen and Wang (2021), Li and Liu (2022), Niu et al. (2018), and Maftoon and Ghafoori (2009), who found no significant difference between the homogeneous versus heterogeneous groups' performance because both groups significantly improved their writing skill and academic achievement. However, this finding is in contrast with the findings of Baer (2003), Kian-sam (1999), Smieja (2012), Susanti et al. (2020), and Tutty and Klein (2008), who reported that high proficiency learners who experienced collaborative writing in homogenous proficiency pairings outperformed their counterparts in heterogeneous proficiency pairings.

Thus, the above-mentioned findings can be justified by claiming that in homogeneous H-H pairs, high proficiency peers are encouraged to review each other's writing, focusing on grammar, punctuation, vocabulary usage, and sentence structure. This process of identifying errors and providing helpful feedback to each other promotes a deeper technical knowledge of English for them. Thus, they reinforce each other's strengths that can lead to higher levels of accuracy through mutual correction and feedback. Similarly, in the heterogeneous H-L class, high proficiency learners are encouraged to function as mentors to provide guidance and support to their low proficiency peers when they encounter language accuracy problems. This collaboration creates a supportive and dynamic learning environment, which helps the high proficiency learners reinforce their own understanding of grammatical and stylistic knowledge.

Thus, supporting collaborative learning theory rooted in Vygotsky's SCT, high proficiency learners' scaffolding in pairs of similar or different proficiency peers, enhanced their writing accuracy without any significant difference. Therefore, they benefited from collaborative activities in both conditions.

Homogeneous versus Heterogeneous Pairing Type on Low Proficiency Learners' Writing Accuracy

To answer the second research question, the results revealed that homogeneous versus heterogeneous pairing types had a significant differential effect on low proficiency Iranian EFL learners' writing accuracy because low proficiency learners in the H-L heterogeneous group significantly outperformed their counterparts in the L-L homogeneous group in terms of their writing accuracy ($M = 0.57 > M = 0.43$).

This finding is partly in line with the claims of Kian-sam (1999), Poole (2008), Smieja (2012), Tutty and Klein (2008), and Zamani (2016), who revealed that cooperative learning in heterogeneous pairing could be especially beneficial for low proficiency students. Moreover, the result follows the finding of Baer (2003), who claimed that homogeneous pairing did not have much positive effect on low proficiency learners. However, this result is in contrast with the claims of Susanti et al. (2020) about the outperformance of low proficiency learners' collaborative writing in homogenous proficiency pairings relative to their counterparts in heterogeneous proficiency pairings.

Furthermore, this finding supports Schmidt's (1990) noticing hypothesis, Long's (1981)

interaction hypothesis, and more importantly, Vygotsky's (1978) SCT, by claiming that a low proficiency peer by collaboratively working with a higher one, who serves as a model of accurate comprehensible language, receives immediate personalized corrective feedback, makes corrections immediately, and develops his/her writing accuracy. In addition, in a heterogeneous pair, a more proficient peer can provide scaffolding and break down complex writing structures into simpler ones, which can help lower proficiency peers build their accurate writing skills. More importantly, working with a more proficient peer can be motivating for less proficient ones because they can see a real example of where they aspire to be.

Thus, in the heterogeneous group, low proficiency learners can get more support and appropriate feedback from the more knowledgeable peers in the pair because according to social cohesion perspective (Moustakas, 2023) and Willer's (2009) theory of collective action, high proficiency peers care about the low proficiency peers' needs and interests as a result of emotional connections among them in a pair. They want the low proficiency peers to promote their knowledge so that the whole pair's performance will be improved, reaching an equilibrium.

On the other hand, the relatively lower performance of low proficiency learners in homogeneous L-L pairs compared to their counterparts in heterogeneous H-L pairs suggests that low proficiency learners' collaboration in homogeneous L-L pairs may be less effective in helping them notice the existing gaps in their grammatical accuracy knowledge, give and receive appropriate and helpful corrective feedback to each other, and hence, develop their writing accuracy. Thus, the superior performance of low proficiency learners in heterogeneous pairs indicates that, without a more proficient peer to model correct language use in group/pair work, low proficiency Iranian EFL learners are not exposed to the correct forms and structures. In addition, working with peers of similar proficiency might not push low proficiency learners to move beyond their comfort zone, which is necessary for language development.

Homogeneous versus Heterogeneous Pairing Type on High Proficiency Learners' Writing Fluency

To answer the third research question, the results revealed that homogeneous versus heterogeneous pairing types had a significant differential effect on high proficiency Iranian EFL learners' writing fluency because high proficiency learners in the H-H homogeneous group significantly outperformed their counterparts in the H-L heterogeneous group in terms of their writing fluency ($M = 14.27 > M = 11.57$).

This result is in accordance with the findings of Baer (2003), Kian-sam (1999), Smieja (2012), Susanti et al. (2020), and Tutty and Klein (2008), who reported that high proficiency learners who experienced collaborative writing in homogenous proficiency pairings outperformed their counterparts in heterogeneous proficiency pairings. Thus, the advantages of homogeneous pairing are almost exclusive to high proficiency learners.

Theoretically, this result supports cognitive elaboration theory (Reigeluth, 1992), which focuses on the importance of learners' background knowledge. According to this theory, expanding new knowledge based on prior knowledge leads to better learning and better achievement. High proficiency learners, possessing adequate background knowledge, in the H-H homogeneous group, share greater prior knowledge, which is essential in developing fluency, than those in the heterogeneous group. Therefore, it is easier for them to collaboratively practice new material and

expand their knowledge based on their advanced prior background. Therefore, peers in the homogeneous H-H group usually outperform those in other groups. Accordingly, in the present research, Iranian EFL learners' collaboration in H-H homogeneous pairs led to significant superiority in writing fluency over their counterparts in H-L heterogeneous pairs.

Moreover, according to the group cohesion perspective (Jones et al., 2022), in an H-H homogeneous pair, the pair members have almost the same commitment and goals, providing them opportunities to collaborate efficiently, access more advanced knowledge and skills, practice deeper processing, and achieve higher academic standards at a faster pace.

Thus, to justify the above-mentioned finding, it can be claimed that both high proficiency learners in H-H homogeneous pairs likely have a solid grasp of the basics, which helps them to focus on practicing more advanced and fluent language use without having to slow down for a less proficient partner. Hence, with peers both operating at a high level, there are fewer interruptions for error correction or basic explanations, and this led to a smoother flow of ideas in writing. Moreover, they can work on more complex writing tasks that are appropriate for their level, resulting in more sophisticated language use and greater writing fluency. It seems that high proficiency learners push each other to perform at their best, leading to a more competitive environment that can enhance their writing fluency as each one tries to match or exceed the other's abilities.

On the other hand, the weaker performance of the high proficiency learners in heterogeneous H-L pairs compared to their counterparts in homogeneous H-H pairs suggests that heterogeneous pairing may be less helpful to improve high proficiency learners' writing fluency. This finding can be explained by the fact that they might focus more on supporting their less proficient peers, and this limits their opportunities to challenge themselves and practice more advanced writing skills that are necessary for improving writing fluency. Additionally, the high proficiency learners, when paired with lower proficiency peers, usually simplify their language to be more comprehensible for their partners. Thus, the writing tasks undertaken in heterogeneous groups are less complex to cater to the needs of the lower proficiency learners, and this might not provide enough challenge for the high proficiency learners to advance their fluency. Moreover, high proficiency learners spend considerable time explaining basic concepts, which reduces the time they have for their own writing practice. Furthermore, without peers at their level to motivate them, high proficiency learners are not adequately challenged to reach their full potential in writing fluency development because there is less competition and less demand for their improvements.

Homogeneous versus Heterogeneous Pairing Type on Low Proficiency Learners' Writing Fluency

To address the fourth research question, the results revealed that homogeneous versus heterogeneous pairing types had a significant differential effect on low proficiency Iranian EFL learners' writing fluency because low proficiency learners in the H-L heterogeneous group significantly outperformed their counterparts in the L-L homogeneous group in terms of their writing fluency ($M = 10.57 > M = 8.77$).

This finding is partly in line with the results obtained by Kian-sam (1999), Poole (2008), Smieja (2012), Slavin (1996), Tutty and Klein (2008), Zamani (2016), and Watson and Marshall (1995) who revealed that cooperative learning in heterogeneous pairing could be especially

beneficial for low proficiency students. Moreover, the result is in accordance with the findings of Baer (2003), who claimed that homogeneous L-L pairing did not have much positive effect on low proficiency learners. However, this result is in contrast with the claims of Susanti et al. (2020) about the outperformance of low proficiency learners' collaborative writing in homogenous proficiency pairings relative to their counterparts in heterogeneous proficiency pairings.

This finding can support Vygotsky's (1978) SCT, mentioning that with assistance or scaffolding from more knowledgeable peers, novice peers in heterogeneous pairs within their ZPD can develop their skills, which leads them to a higher level of development and their ultimate autonomy.

This finding can be justified by the fact that in the H-L paired group, low proficiency learners are exposed to more advanced language use by their high proficiency peers, who can provide a model for higher-level writing, encouraging the development of fluency. Moreover, supporting Schmidt's (l990) noticing hypothesis and Long's (1981) interaction hypothesis, they are likely to receive more comprehensible input from their more proficient peers, and this condition can help them notice and correct their errors more effectively than they would have in an L-L group. In addition, psychologically, working with a higher proficiency peer can be motivating for lower proficiency learners as they attempt to match the ability level of their partners, which leads to increased effort and practice. Therefore, the support provided by high proficiency learners serves as a scaffold that enables the lower proficiency learners to perform tasks they would not be able to do independently, thus leading to greater improvements in their writing fluency.

However, the relatively lower performance of low proficiency learners in the L-L homogeneous group compared to their counterparts in heterogeneous H-L pairs indicates that homogeneous pairing may be less effective for low proficiency learners' writing fluency development because they had limited exposure to language input and models of proficient writing. This condition can hinder the development of their writing fluency and may result in limited types of language structures and vocabulary in their writing. Moreover, it seems that interacting with peers of similar proficiency level does not provide the cognitive stimulation needed to efficiently enhance low proficiency learners' writing fluency compared to heterogeneous pairing arrangements.

Theoretical and Pedagogical Implications

Regarding high proficient learners, the results of this study supporting Vygotsky's SCT and Sweller's (1988) cognitive load theory imply that in H-H pairs, high proficiency learners can engage in activities that appropriately challenge their cognitive abilities within their ZPD, and this condition leads to improved writing accuracy and fluency. Accordingly, in H-L pairs, the more proficient learner who acts as a scaffolder can manage the cognitive load of the less proficient learner, leading to improved accuracy. However, the relatively weaker fluency outcome of high proficiency learners in H-L pairs compared to H-H pairs suggests that the more proficient learners may allocate more cognitive resources to supporting the less proficient ones, which may be associated with less optimal improvement in their fluency. Thus, the results of this study, adding new insights to cognitive load theory, argue that fluency demands more cognitive load than accuracy, especially when collaborating with a low proficiency peer.

Regarding low proficiency learners, the findings of this research, supporting Krashen's (1985) input hypothesis and Vygotsky's SCT, propose that H-L pairing provides low proficiency learners with

comprehensible input that is slightly above their current proficiency level and hence the opportunities for meaningful interactions and negotiation of meaning. However, according to cognitive load theory (Sweller, 1988), the weaker performance of low proficiency learners in L-L pairs compared to H-L pairs implies that when both learners are at a similar cognitive level, they may not receive as many valuable learning opportunities and supports as their counterparts in heterogeneous pairs, and this condition may limit their language development compared to heterogeneous pairing arrangements..

Therefore, the findings of this study provide EFL teachers with valuable insights about how to benefit from homogeneous and heterogeneous pairings of high and low proficiency learners in the EFL classroom contexts, particularly in developing EFL writing accuracy and fluency. Furthermore, this study contributes to the literature by introducing some pedagogical implications for EFL education researchers regarding the usefulness of H-H pairing for high proficiency learners and H-L pairing for low-ability learners' writing accuracy and fluency. Furthermore, the results of this study can provide insights to the EFL syllabus designers for incorporating the differentiated writing tasks to meet the different needs of learners with different proficiency levels in H-H and H-L pairs. For the high proficiency learners, more complex and challenging writing assignments can be included to promote their more advanced language use. For low proficiency learners, scaffolded writing tasks can be designed to provide additional support and guidance. In heterogeneous pairs, teacher scaffolding is suggested as a remedy to improve high proficient learners' writing ability.

Conclusion and Suggestions for Further Research

In line with the shift towards the communicative approach in language learning, this study examined the writing accuracy and fluency of high and low proficiency learners across the homogeneous (H-H & L-L) and heterogeneous (H-L) pairs. The results of a two-way MANCOVA, univariate analyses, and post-hoc comparisons showed no significant differences in writing accuracy of the high proficiency learners in homogeneous H-H and heterogeneous H-L pairs. However, the writing fluency of high proficiency learners in the homogeneous H-H pairs significantly outperformed their counterparts in the heterogeneous H-L pairs. Furthermore, in terms of low proficiency learners' achievement, the findings indicated a significant difference in their writing accuracy and fluency between the homogeneous L-L and heterogeneous H-L groups. Specifically, low proficiency learners performed better in the heterogeneous H-L paired group compared to their counterparts in the homogeneous L-L group.

For further research, examining EFL learners' other language skills like speaking, exploring an interplay between complexity, accuracy, and fluency to provide a more comprehensive understanding of language proficiency, the collaboration in groups of more than two, and including other factors like gender and cultural backgrounds are suggested.

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Appendix A: IELTS General Writing Tasks' Topics

WRITING TASK 2

You should spend about 50 minutes on this task.

Write about the following topics:

Collaborative writing task 1: Nowadays, more and more college students start to use cell phones in class. Some people argue that college students should not be allowed to bring cell phones to class. However, others disagree. What is your opinion on this issue? Work with your partner to write an essay on this issue.

Collaborative writing task 2: Nowadays, many college graduates rely on their parents for financial support. Some people think college graduates should not rely on their parents financially. However, others disagree. What is your opinion on this issue? Work with your partner to write an essay on this issue.

Collaborative writing task 3: Exams are an important part of education in many countries. Discuss the advantages and disadvantages of exams and give your opinion about the role exams should play in education systems.

Collaborative writing task 4: Some people feel online courses are better while others feel classroom courses are good. Discuss both the views and give your opinion.

Collaborative writing task 5: Some people believe that teaching children at home is best for a child's development while others think that it is important for children to go to school. Discuss the advantages of both methods and give your own opinion. Give reasons for your answer and include any relevant examples from your own knowledge or experience.

Collaborative writing task 6: In Britain, when someone gets old they often go to live in a home with other old people where there are nurses to look after them. Sometimes the government has to pay for this care. Who do you think should pay for this care, the government or the family? Give reasons for your answer and include any relevant examples from your own knowledge or experience.

Collaborative writing task 7: Nowadays, children watch a lot of TV and play video games. However, some think that these activities are not beneficial for a child's mental health. To what extent do you agree or disagree?

Collaborative writing task 8: Modern technology now allows rapid and uncontrolled access to information in many countries. This is a danger to our societies. To what extent do you agree or disagree?

Collaborative writing task 9: Doctors recommend that older people exercise regularly. However, many of them do not get enough exercise. What are the reasons? What can be done to encourage them to exercise more?

Collaborative writing task 10: Many people believe that film is a less important art than other forms such as literature and painting. To what extent do you agree or disagree?

Collaborative writing task 11: In some places, young people find it difficult to communicate with older people. Why is this? What are the solutions?

Collaborative writing task 12: Many parents put a lot of pressure on their children to succeed. To what extent do you agree?

Collaborative writing task 13**:** In cities and towns all over the world, the high volume of traffic is a problem. What are the causes of this, and what actions can be taken to solve this problem?

Collaborative writing task 14: Some people think that the teenage years are the happiest times of most people's lives. Others think that adult life brings more happiness, in spite of greater responsibilities. Discuss both these views and give your own opinion.

Collaborative writing task 15: Some people say that music is a good way of bringing people of different cultures and ages together. To what extent do you agree or disagree with this opinion?