

## THE EFFECTS OF PAIR COLLABORATION AND SELF-EFFICACY ON EFL COLLEGE STUDENTS' WRITING QUALITY

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### Abstract

Pair collaboration might contribute to students' writing quality, but that effect might differ across students with different levels of writing self-efficacy. This study aimed to explain how different kinds of writing self-efficacy-based pair formations affect the students' writing quality in the aspect of content, organization, and language use. The participants in this study were college students majoring in English language teaching (N= 135). This experimental study consisted of three phases, where in each phase, different combinations of comparison were investigated through counter-balanced experimental design. The main inferential statistical analysis employed in this study were including Two-way repeated measure ANOVA, Friedman's ANOVA and Wilcoxon Signed Rank Test to provide evidences on the simple effect of the comparisons. The findings showed that: first, students who write collaboratively in a homogeneous pair produce a significantly better writing quality than those who write individually regardless of their writing self-efficacy level. Second, high levels of self-efficacy students writing individually produce better writing quality than heterogeneous (high-low) pairs. Third, homogeneous pairs of high self-efficacy students outperformed heterogeneous pairs in terms of their writing quality. These findings implied that heterogenous pairs are recommended for learning purposes. However, homogenous pairs are recommended for assessment to minimize evaluation errors. Consequently, these results advocate for a differentiated pedagogical approach where instructors strategically shift from heterogeneous "growth-oriented" scaffolding during writing instructions to homogeneous "performance-oriented" grouping for summative tasks, ensuring that individual accountability is preserved without stifling the social benefits of peer collaboration.

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## INTRODUCTION

Collaboration in writing is deemed to have many benefits, ranging from improved writing quality (Robayo Luna and Hernandez Ortiz, 2013; Utami et al., 2023) to increased learner confidence (Bavarava, 2020). A rapidly developing body of research in ELT has dealt with collaboration in writing. Studies that focus on investigating the interaction effect caused by collaboration and other related variables toward writing quality could give a valuable

contribution for the field of collaborative writing research. There are several variables which are investigated for their ability to interact with collaboration in affecting writing quality, namely writing proficiency (Pae, 2011; Salam & Nurnisa, 2021; Susanto, 2021), language proficiency (Soleimani, Modirkhamene, & Sadeghi, 2017), transactional writing belief (Cuevas et al., 2016), and types of feedback (Guasch, Espasa, Alvarez, & Paul, 2013). The findings from the investigation of interaction effect between collaboration and writing proficiency toward writing quality explain that the students who write collaboratively could gain a better score than those who write individually regardless of their writing proficiency, although the difference is not significant (Pae, 2011). Besides, Soleimani et al., (2017) also found that across both proficiency levels, collaborative groups outperformed the individual groups in terms of fluency and accuracy but not in complexity, however the significant difference is only found in the aspect of accuracy.

Moreover, an interaction is also found between collaboration and student's individual transactional beliefs. Cuevas et al. (2016) reveal that students in the high-high transactional dyads wrote texts with a higher level of organization and integration of opposing viewpoints than students in low transactional belief dyads. However, if the initial opinions are different within the dyads, the high-high dyads generate constructive problem-solving more frequently compared with the low transactional belief dyads. In contrast, if the initial opinions are the same within the dyads, the dyads with lower transactional belief use more transactional strategies. It means that different dyads composed by different levels of interactional belief may use different problem-solving strategies. These findings indicate that exploring the individual variables might lead us to a new horizon of research in collaborative writing (Van Steendam, 2016; Salam & Nurnisa, 2021; Susanto, 2021).

Other individual variables, apart from language proficiency or transactional beliefs, that might affect students' performance in a collaborative writing activity should be included to see how different forms of collaborative activity focus on different aspects of writing quality (i.e., content, organization and language use). One of the variables that was reported to have strong relationship and strong predicting power toward writing quality is self-efficacy (Bruning, Dempsey, Kauffman, McKim, & Zumbunn, 2013; Huerta, Goodson, Beigi, & Chlup, 2017; Pajares, 2007; Putra, Saukah, Basthomi, & Irawati, 2020; Utami et al., 2023).

Self-efficacy in writing is an interesting and developing area for both self-efficacy and writing research. Writing self-efficacy is a writing domain-specific construct which is operationalized and measured based on the properties of the expected writing outcomes. It means that writing self-efficacy has its own properties which become the basis in constructing the measurement scales (Bruning et al., 2013; Prat-Sala & Redford, 2012; Karim et al., 2020; Lestari, 2020). Self-efficacy in writing is also defined as the writers' judgment about their capability in coping with the psychological, linguistic and behavioral challenges (Bruning et al., 2013; Nurul Fitriyanti Th. & Zainurrahman, 2022). This definition is then developed into the three dimensions of writing self-efficacy, namely ideation, convention and self-regulation.



Many studies were done to investigate the role of self-efficacy on students' writing performance and quality (Bruning et al., 2013; Callinan, van der Zee, & Wilson, 2018; Ekholm, Zumbunn, & Conklin, 2015; Huerta et al., 2017; Lichtinger, 2018; Limpo & Alves, 2017). However, it is always easier to predict the actual writing quality based on writing self-efficacy and other influential factors (e.g., self-regulation, grading system, etc.) which interact in an individual writing environment. Thus, a collaborative writing environment would challenge individual self-efficacy. As a result, this challenge may affect writing quality differently than individual writing which makes it important to explore how self-efficacy affects the pair collaboration outcomes. Therefore, the inclusion of writing self-efficacy can be thought of to generate more comprehensive conclusions on whether writing self-efficacy modifies the effect of pair collaboration on students' writing quality.

While previous studies underscore the potential of collaborative writing, the interplay between pair composition and psychological variables remains underexplored. Consequently, this study seeks to determine whether the impact of pair collaboration on writing quality is moderated by students' levels of writing self-efficacy. To address this overarching inquiry, the research investigates whether homogeneous pairs with equal self-efficacy levels produce better argumentative essays compared to students working individually, and similarly, whether heterogeneous pairs with unequal self-efficacy levels offer a significant advantage over individual writing. Furthermore, by directly comparing the performance of homogeneous and heterogeneous pairs, this study aims to identify the most effective formation for enhancing writing quality. These questions provide the necessary framework for the experimental design and statistical analyses detailed in the following methodology.

**RESEARCH METHOD**

This experimental study consisted of three phases, where each phase required two consecutive meetings lasting for 100 minutes per meeting. Phase 1 compared the quality of students' writings produced by homogeneous self-efficacy pairs with those produced by students who work individually. In phase 2, individual writing quality was compared with the quality of writing produced by heterogeneous self-efficacy pairs. Phase 3 investigated the comparison between homogeneous and heterogeneous self-efficacy pairs' writing quality. The students who worked in pairs were expected to produce a single writing product. To control for order effects, a counterbalancing method was applied across subjects in organizing the class for experimental procedure. This procedure in each phase can be visualized as follows. Table 1 provides the symbols and codes used in illustrating the pairing arrangement.

Table 1  
Symbols and Codes Used in Illustrating the Pairing Arrangement

No.	Symbols & Codes	Remarks
1.		Pair Collaborative Writing
2.		Individual Writing
3.		High Self-Efficacy Students
4.		Low-Self-Efficacy Students
5.	<b>GH</b>	Group of High Self-Efficacy Students
6.	<b>GL</b>	Group of Low Self-Efficacy Students

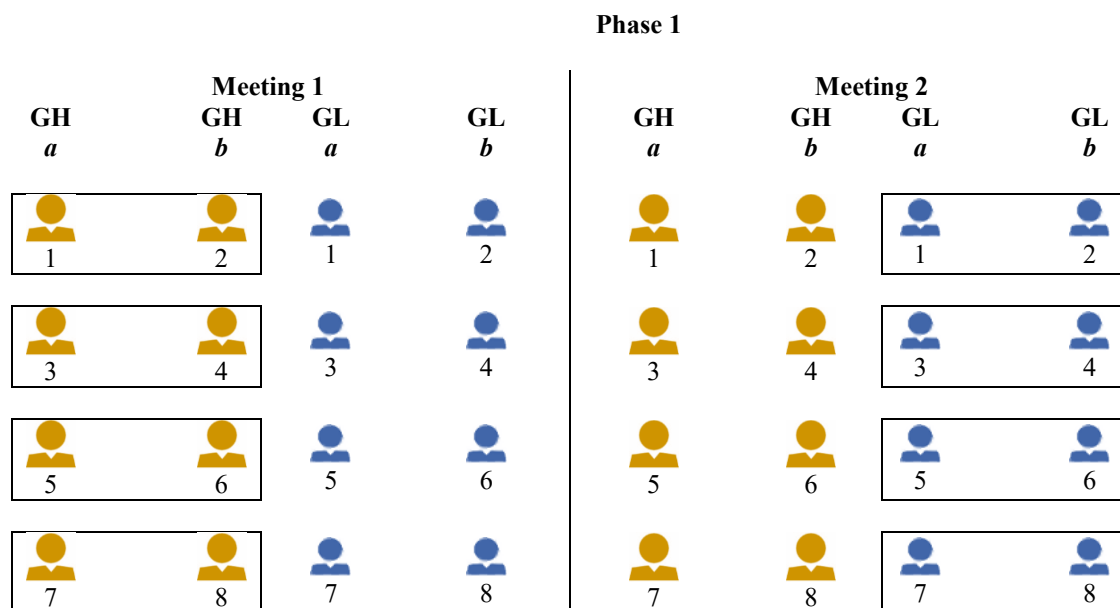


Figure 1. Across Subjects Counterbalancing in Phase 1.



Figure 2. Across Subjects Counterbalancing in Phase 2.

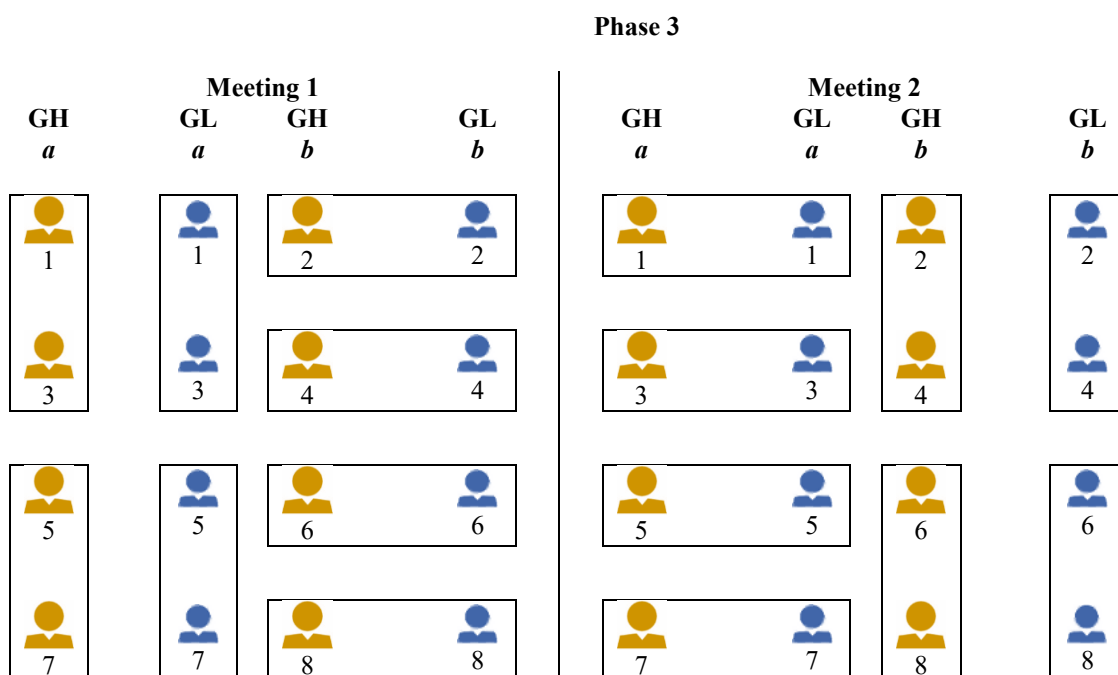


Figure 3. Across Subjects Counterbalancing in Phase 3.

The three research phases are intended to answer each research question. The summary of the research flow and its consecutive research question answered can be seen in the figure below.

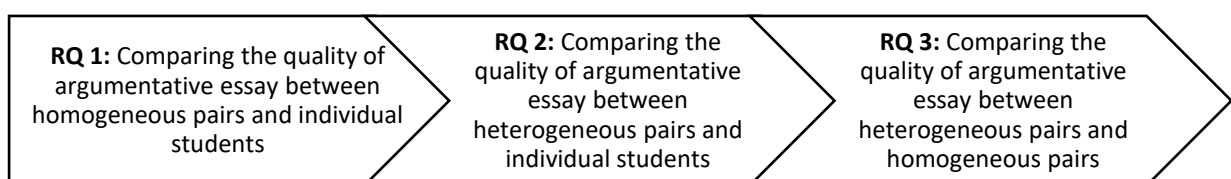


Figure 4. Research Flow

## Research Participants

The participants in this study were fourth-semester students from the English Language Teaching department at Mahasaraswati University Denpasar, enrolled in an argumentative writing class (N=135; total of 4 classes). The participants' ages ranged from 19 to 21 years, representing the typical age bracket for second-year university students in Indonesia. They spoke English as a foreign language (EFL), with a forecasted proficiency level ranging from B1 to B2 (Intermediate to Upper-Intermediate) according to the CEFR standard. Prior to this study, they had successfully completed several prerequisite writing courses, including Intensive English (Semester 1), Paragraph Writing (Semester 2), and Essay Writing (Semester 3). Based on this academic background, they were considered to possess comparable basic writing skills and the necessary linguistic foundation for argumentative composition.

## Instruments and Data Analysis

### *Students' Writing Self-Efficacy Level*

The data representing students' level of writing self-efficacy was used as the basis of pair formation. Self-Efficacy for Writing Scale (SEWS) by Bruning et al., (2013) was adapted to measure students' writing self-efficacy level. SEWS originally comprises three main dimensions, namely; ideation, conventions, and self-regulation. There are 16 items in 0-100 response format scale, ranging from no confidence to complete confidence. For this study, 3 items were added for ideation dimension to suit the writing domain investigated in this study, so the total items for the SEWS are 19. A pilot study was conducted, involving 91 ELT students at Universitas Negeri Malang to refine the modified Self-Efficacy Writing Scale (SEWS). Participants reported no clarity issues, completing the instrument in an average of 10 minutes. Statistical validation yielded a KMO value of .89, a significant Bartlett's Test ( $p < .001$ ), and anti-image correlations between .80 and .93, with all factor loadings exceeding .50. Furthermore, the instrument demonstrated high internal consistency, with Cronbach's Alpha values of .95 for Ideation and .89 for both Conventions and Self-regulation. These results, which surpassed previous benchmarks by Bruning et al. (2013), confirmed the modified SEWS as a valid and reliable tool for measuring writing self-efficacy in this study.

Table 2  
The Original Dimensions and Modified Items of SEWS

Dimensions	Items
<b>Ideation</b>	1. I can think of many ways to write an opinion about an issue.
	2. I can think of many ideas to support my arguments in writing.
	3. I can think of many details to support my reasoning.
	4. I can think of many ways to conclude an argument.
	5. I can put all of my ideas into writing.
	6. I can think of many words to describe my ideas.
	7. I can think of a lot of original ideas for my opinion.
	8. I know exactly where to place my ideas in my writing.
<b>Convention</b>	9. I can spell my words correctly.
	10. I can write complete sentences.
	11. I can punctuate my sentences correctly.
	12. I can write grammatically correct sentences.
	13. I can begin my paragraphs in the right spots.
<b>Self-Regulation</b>	14. I can focus on my writing for at least one hour.
	15. I can avoid distractions while I write.
	16. I can start writing assignments quickly.
	17. I can control my frustration when I write.
	18. I can think of my writing goals before I write.
	19. I can keep writing even when it's difficult.

Adapted from; Bruning et al. (2013)

Table 3 provides the number of students who were eligible to be included in the analysis based on their SEWS scores.

Table 3  
Number of Eligible Students for Analysis based on SEWS Score

No.	Class	Participating		Eligible		Excluded	
		High	Low	High	Low	High	Low
1.	A	20	11	11	3	9	8
2.	C	14	22	8	17	6	5
3.	D	18	18	11	9	7	9
4.	E	14	18	8	9	6	9
<b>Total</b>		<b>66</b>	<b>69</b>	<b>38</b>	<b>38</b>	<b>28</b>	<b>31</b>
		<b>135</b>		<b>76</b>		<b>59</b>	

From that number of eligible participants, it was expected that there were at least 38 high-self-efficacy individual writers, 38 low-self-efficacy individual writers, 19 homogeneous high-self-efficacy pairs, 19 homogeneous low-self-efficacy pairs, and 38 heterogeneous pairs of high and low-self-efficacy students' essay products that could be analyzed in each phase of this study. However, some cases, such as; absence of the participants, incomplete essay product, and missing data, prevented the number of usable essay products to be stable through the three phases of this study. The actual analyzed essay products across the three phases is summarized in Table 4.

Table 4  
Number of Actual Essay Products Analyzed in Each Phase

Types of Pairing	Phase 1	Phase 2	Phase 3
PC-HH	14	-	19
PC-LL	9	-	19
PC-HL	-	12	38
IW-H	28	12	-
IW-L	18	12	-

### Students' Writing Quality

The writing task was developed based on the TOEFL test domain of writing framework (Cumming, Kantor, Powers, Santos, & Taylor, 2000). The task type used is an independent invention task, where the students were asked to write a four-paragraph essay based on a short prompt in 90 minutes. The quality of students' writing was evaluated using the scoring rubric (Appendix 1), which covered the aspects of content, organization and language use (McDonough et al., 2018). There were two raters assessing the students' writing products. The agreement between the two raters was considered positively high, indicated by *Pearson Correlation Coefficient*,  $r = .81$ ,  $p < .001$ . Besides, the estimate of internal consistency is also highly indicated by *Cronbach's*,  $\alpha = .90$ . Table 5 summarizes the data collection and its analysis in every phase of this research trilogy.

The data analysis of the writing quality comparison in each phase was done through rigorous selection of inferential statistical tests. Phase 1 utilized a Two-way Repeated Measure ANOVA to examine interaction effects between collaboration and self-efficacy. For Phases 2 and 3, Friedman's ANOVA and Wilcoxon Signed Rank tests were employed as non-parametric alternatives; these were selected to maintain statistical rigor when data distributions violated the normality assumptions required for parametric testing. All phases followed a four-step analysis examining overall essay quality and specific dimensions: content, organization, and convention. This comprehensive approach identifies which specific writing aspects are most influenced by different pairing configurations.

Table 5  
The Blue Print of Data Collection and Analysis

	Phase 1	Phase 2	Phase 3
<b>Data</b>	1. Writing self-efficacy score as the basis of pairing arrangement		
	2. Writing quality produced by; a. PC-HH b. PC-LL c. IW-H d. IW-L	2. Writing quality produced by; a. PC-HL b. IW-H c. IW-L	2. Writing quality produced by; a. PC-HH b. PC-LL c. PC-HL
<b>Instrument</b>	1. Self-Efficacy for Writing Scale / SEWS (Bruning et al., 2013) 2. a. Opinion Essay Writing Tasks b. Analytic scoring rubric		
<b>Data</b>	Descriptive Statistical Analysis		
<b>Analysis</b>	Inferential Statistical Analysis		
	<b>Two-way repeated measure ANOVA &amp; Wilcoxon Signed Rank Test</b>	<b>Friedman's ANOVA &amp; Wilcoxon Signed Rank Test</b>	

Note: PC-HH = Pair Collaborative Writing done by High-High writing self-efficacy pairs.  
PC-LL = Pair Collaborative Writing done by Low-Low writing self-efficacy pairs.  
PC-HL = Pair Collaborative Writing done by High-Low writing self-efficacy pairs.  
IW-H = Individual Writing done by High writing self-efficacy students.  
IW-L = Individual Writing done by Low writing self-efficacy students.

## RESEARCH FINDINGS AND DISCUSSION

### The Difference in Writing Quality between Homogeneous Pairs and Individual Students

The first phase of this research trilogy was employed to answer the first research question regarding whether homogeneous pairs with equal self-efficacy levels write better essays than individual students. Table 6 shows that, in phase 1, IW-H as well as IW-L achieved higher scores in writing quality when they were grouped into homogeneous pairs. Besides, PC-HH gained the highest mean score in the aspects of content and organization, but not for the language use. A two-way repeated measure ANOVA was used to check whether these differences were significant.

Table 6  
Descriptive Statistic of Phase 1

Writing Condition	n	Content		Organization		Language Use		Overall Scores	
		M	SD	M	SD	M	SD	M	SD
PC-HH	14	8.14	0.91	8.71	0.45	7.50	0.63	24.4	1.49
PC-LL	9	7.22	0.92	8.00	1.25	7.33	0.67	22.6	2.50
IW-H	28	7.36	1.23	8.14	1.06	7.54	0.78	23.0	2.28
IW-L	18	6.94	1.18	7.72	1.37	7.17	0.96	21.8	3.04

The results of the analysis in phase 1 explicated that there was no statistical difference in the interaction effect of pair collaboration and self-efficacy on the overall score, *Wilks' Lambda*,  $F(1, 8) = .39, p = .55, \eta^2 = .046$ , content score, *Wilks' Lambda*,  $F(1, 8) = 2.41, p = .16, \eta^2 = .23$ , organization score of students' writing quality, *Wilks' Lambda*,  $F(1, 8) = .001, p = 1.00, \eta^2 = .001$ , and also language use score of students' writing quality, *Wilks' Lambda*,  $F(1, 8) = .001, p = 1.00, \eta^2 = .001$ . These results show that the effect of pair collaboration on students' writing quality does not depend on the level of students' writing self-efficacy forming the pairs.

Previous studies on the interaction of two independent variables which include homogeneous pair collaboration as one of the variables showed that students who worked in pairs scored better writing quality regardless of the second independent variable investigated, namely proficiency (Pae, 2011; Soleimani et al., 2017). The writing quality, which was produced in pairs by both high and low proficiency groups, was better compared to when they were

working individually (Pae, 2011; Nurul Fitriyanti Th. & Zainurrahman, 2022). Moreover, the interaction effect between peer-mediated pairs and proficiency was not statistically significant (Soleimani et al., 2017).

Similar to Pae (2011) and Soleimani et al. (2017), in this research, the interaction of homogeneous pair collaboration and students' writing self-efficacy level had no significant impact on students' writing quality both in the overall scores of writing quality and also its assessment criteria. Students' ability in generating ideas, organizing the structure of their writing and also their ability in using a proper language in terms of spelling, and grammatical forms were better when they are working in homogeneous pairs regardless of their self-efficacy level rather than when they are working individually.

The finding in phase 1 strengthened the claim that the quality of any collaborative work depended not only on the students proficiency and/or self-efficacy, but there were many other things, such as attitude and motivation (Strauss & Alice, 2007), transactional beliefs (Cuevas et al., 2016), teacher assistance (Amiryousefi, 2017; Soleimani et al., 2017), collaborative conflict management (Pae, 2011) and many more. Besides, from the methodological point of view, the insignificant findings on the interaction effect might be caused by four possible reasons, namely the personality of the participating students, the lack of sample size, the absence of pair formation variation, and the sensitivity of the scoring rubric.

In terms of the findings on the main effect of pair collaboration, the statistical difference was only observed for the overall score, *Wilks' Lambda*,  $F(1, 8) = 7.33$ ,  $p = .027$ ,  $\eta^2 = .48$ , and content, *Wilks' Lambda*,  $F(1, 8) = 15.1$ ,  $p = .005$ ,  $\eta^2 = .65$ , but not for the organization and language use. These results align with the previous findings showing that students who write collaboratively in pair would produce a significantly better writing quality than those produced by individual students (Hsu & Lo, 2018; Krishnan, Cusimano, Wang, & Yim, 2018; McDonough, De Vleeschauwer, & Crawford, 2018; McDonough & Fuentes, 2015; Pae, 2011; Soleimani et al., 2017). Recent studies from Hsu and Lo (2018) found that students who had experienced pair collaboration could write a significantly better essay in terms of the content quality and linguistic accuracy compared with students who wrote their essay individually. Students who work in pair were benefited from peer feedback where they may: a) discuss the effectiveness and the clarity of their statement which led to a better content quality, b) identify any irrelevant points, redundancy, and incomprehensibility, and also c) reflect on how they conveyed their messages and stayed more focused on topics.

With regard to organization and language use, the result from phase 1 shows that no statistically significant difference was revealed between pair collaboration and individual writing. This result was also similar to Hsu and Lo (2018) and McDonough et al. (2018), who stated that the texts produced by students working in pairs and individuals were similar in terms of organization, and language use. However, this result was different from previous studies which apply a longer period of collaborative writing treatment and also longer duration in producing the text (Wang, 2015; Afyattena & Pravitasari, 2022; Mierwald et al., 2022). In his study, he engaged his learners in collaborating on two writing assignments over a 12-week period, while in this study students were asked to finish one writing product in a single meeting. Therefore, due to the limited time given, the students working in a homogeneous pair tend to focus more on improving the ideas of the content of their essay rather than improving the organization and language use.

In phase 1, homogeneous pairs that consist of students with higher self-efficacy level could produce a significantly better writing quality because the members of the pair possessed higher levels of self-regulation in writing. As suggested by Storch (2002), students with equally high individual traits (in this case writing self-efficacy) might have equal and mutual interaction, in which they are able to visualize their success path in writing which would guide them to achieve their goal (Bandura, 1989; S. L. Wang & Lin, 2007; Utami et al., 2023).

Besides, the analysis on the main effect of self-efficacy on students' writing quality revealed that there was no significant difference between the writing quality produced by the high self-efficacy students and the low self-efficacy students in terms of overall score and also in all analytical aspects compared (content, organization, and language use). It means that there was not enough evidence that could prove that the students with higher level of self-efficacy could produce better writing quality than those with low level of writing self-efficacy. This result was also in line with the result from Setyowati (2015) who found that there was no difference in the students' writing performance between the high and low self-efficacy students.

The aforementioned results might reflect the inconsistencies of the relationship and contribution of self-efficacy on students' writing performance. Limpo and Alves (2017) argue that among the dimensions of SEWS, only self-efficacy for self-regulation contributes to writing performance and quality. This result is in line with Callinan et al. (2018) who mention that students' level of confidence influences their writing performance, which is mediated by their actual writing ability. Students who admit that they have a high level of self-efficacy in writing might not have the actual writing ability required to accomplish the task given. In this case, Lichtinger (2018) also argued that there was a gap between students' writing self-efficacy and teachers' general perception on students' writing level. This fact suggests the importance of improving students' writing strategies and self-regulation, which include time, attention, motivation, and learning environment management.

### The Difference between the Quality of Writings Produced by Heterogeneous Pairs and Individual Students

The second phase of the study was conducted to address the second research question, investigating whether heterogeneous pairs with unequal self-efficacy levels produce higher quality writing than students working individually. The study phase 2 was actually conducted to see whether the findings in phase 1 remain similar if the comparison was done between heterogeneous pairs and individual writers. Table 7 shows descriptive statistics for students' essay scores across 3 writing conditions, i.e., PC-HL, IW-H, and IW-L.

Table 7  
Descriptive Statistic of Phase 2

Writing Condition	n	Content		Organization		Language Use		Overall Scores	
		M	SD	M	SD	M	SD	M	SD
PC-HL	12	6.83	0.55	8.08	0.64	7.00	0.71	21.92	1.32
IW-H	12	7.67	0.47	8.25	0.43	7.83	0.55	23.75	1.01
IW-L	12	7.25	0.43	8.17	0.55	7.75	0.60	23.17	1.28

The findings from descriptive statistical analysis on phase 2 show that IW-H produced a significantly better writing quality in terms of overall scores, and all aspects of writing quality. A series of Friedman's ANOVA was used to check whether these differences were significant. Statistically significant effects of different writing conditions toward students' opinion essay quality were only found in terms of: a) overall score; *Friedman's ANOVA*,  $\chi^2(2) = 11.38$ ,  $p = .003$ , *Kendall's W* = .48 (moderate effect size), b) content; *Friedman's ANOVA*,  $\chi^2(2) = 10.13$ ,  $p = .006$ , *Kendall's W* = .42 (moderate effect size), c) language use, *Friedman's ANOVA*,  $\chi^2(2) = 8.60$ ,  $p = .014$ , *Kendall's W* = .37 (moderate effect size). Different from the analysis of the students' writing quality in the aspects of content and language use, the analysis of differences among students' organization scores yielded a result where there is no statistically significant effect, *Friedman's ANOVA*,  $\chi^2(2) = 2.00$ ,  $p = .368$ , with *Kendall's W* is .083.

Based on the findings in phase 2, in its relation to findings in phase 1, it might be concludable that pair collaboration may outperform individual writers if the collaborations are between the students with equal self-efficacy level. However, if the collaborations are between the students with different levels of self-efficacy, it would not give a positive effect on the writing

product's quality, or in its practice, lower than the writing quality written individually. In terms of writing productivity, this finding refines the statement which claimed that collaboratively produced texts are better than individually produced texts (McDonough et al., 2018; Noel & Robert, 2004; Pae, 2011; Soleimani et al., 2017). The collaboratively produced texts are better than those which are produced individually, only if the students who work in pairs are those with equal properties of individual traits.

The study phase 2 also reveals that the overall essay scores of the individual students with low self-efficacy were better but not significantly different from those written in heterogeneous pairs. It seems that students from low-self-efficacy groups gain better learning experience from the collaborative activity in phase 1 and also phase 2. It was also proven by a non-significant difference of the writing quality between both high and low self-efficacy students working individually. It shows that collaborative activity, both homogeneous and heterogenous pairing, provide a beneficial learning experience for the students (Maftoon & Ghafoori, F, 2009). However, the findings in phase 2 supported the claim made by Fauziah & Latief (2015) who states that, in terms of learning, heterogeneous grouping was more effective than the homogeneous grouping only for low achievers but not for high achievers. Besides, recent study also found that novice and passive members of the pairs would observe their dominant and expert peers during the pair work which would promote their learning. However, for the final writing product, the expert and dominant students showed least improvement (Jang & Cheung, 2019; Afiyattena & Pravitasari, 2022; Mierwald et al., 2022).

### The Difference between the Quality of Writings Produced by Homogeneous Pairs and Heterogeneous Pairs

The third phase of this study aimed to answer the third research question by comparing the effectiveness of homogeneous versus heterogeneous pair formations. This analysis focused on determining which specific pairing strategy resulted in superior writing quality across content, organization, and language use. Descriptive statistical analysis in Table 9 shows that PC-HH gained the highest mean score among the other conditions in terms of overall opinion essay score and also each aspect of the analytical scoring. Besides, Table 8 also shows that PC-LL scored less writing quality compared with PC-HL. A series of Friedman's ANOVA was used to check whether these differences were significant.

Table 8  
Descriptive Statistic of Phase 3

Writing Condition	n	Content		Organization		Language Use		Overall Scores	
		M	SD	M	SD	M	SD	M	SD
PC-HL	12	7.87	0.47	7.37	0.53	7.45	0.50	22.68	0.98
PC-HH	12	8.53	0.50	7.68	0.80	7.74	0.55	23.95	4.77
PC-LL	12	8.05	1.10	7.05	1.23	7.32	0.73	22.42	7.97

Statistically significant effects of different writing conditions toward students' opinion essay quality were only found in terms of: a) overall score, *Friedman's ANOVA*,  $\chi^2(2) = 11.12$ ,  $p = .004$ , *Kendall's W* = .29 (small effect size), b) content, *Friedman's ANOVA*,  $\chi^2(2) = 13.50$ ,  $p = .001$ , *Kendall's W* = .36 (moderate effect size), and c) language use, *Friedman's ANOVA*,  $\chi^2(2) = 7.55$ ,  $p = .023$ , *Kendall's W* = .20 (small effect size). However, the analysis on the students' writing quality in the aspect of organization indicated that there is no statistical significance identified, *Friedman's ANOVA*,  $\chi^2(2) = 4.51$ ,  $p = .11$ , with *Kendall's W* is .20 which indicates small effect size. These findings might become the evidence of the effectiveness of mutuality and equality in a pair interaction (Hsieh, 2019; Storch, 2002). There are four patterns of pair interaction based on the level of mutuality and equality of the pairs, i.e., collaborative, dominant/dominant, dominant/passive, and expert/novice (Storch, 2002). Students in high-high self-efficacy pairs might have either high equality or mutuality during the process of writing. Therefore, it affects the writing quality.

The findings from phase 3 might also prove that PC-HH could form highly collaborative pairs. This type of pair is similar to self-selected pairs where students probably choose peers who are perceived to have equal properties/individual traits which might be beneficial for them to accomplish the task successfully. Recent studies had found that 64% of self-selected pairs would form highly collaborative pairs in both face-to-face and internet supported environments (Hsieh, 2019; Kioumars, Shalmani, & Meymeh, 2018). In terms of their productivity, self-selected pairs were also effective in producing better writing quality compared with heterogeneous pairs (Alfino, Adnan Latief, Widiati, & Saukah, 2019) and even individual students (Dobao, 2012; Hsieh, 2019; Hsu & Lo, 2018; Louth, McAllister, & McAllister, 1993; McDonough et al., 2018; Wigglesworth & Storch, 2009)

### The Contributions to Related Theories

The absence of the interaction effect between self-efficacy and pair collaboration suggests that students' in both high and low self-efficacy pairs would perform better than when they are working individually. This condition is termed as collective efficacy (S. L. Wang & Lin, 2007). The pre-exist concept of self-efficacy has categorized self-efficacy into two main types, namely; (1) *generalized self-efficacy*, the belief that one could be successful on a non-specific, global task, and (2) *specific self-efficacy*, the belief that one can complete a task-specific behavior from a domain-specific construct (Bandura, 1997; Green, 2003; Troia, Shankland, & Wolbers, 2012). However, those types are probably limited to the type of individual self-efficacy. In collaborative circumstances, Collective efficacy can be defined as "*a group's shared beliefs in its conjoint capabilities to execute the courses of action required to achieve designated goals*" (Wang & Lin, 2007, p. 2259). In other words, it is the combination of self-efficacy owned by each member of the pair. In this study, pairs who shared an equal level of self-efficacy could produce a better writing quality, while if the pairs consisted of students with unequal levels of self-efficacy, the collective efficacy was not as effective as the homogeneous pair.

The collective efficacy in heterogeneous pairs is not as effective as that in homogeneous pairs. It might be because the students' with high self-efficacy would be able to visualize success scenarios that provide positive guides for performance, while their peers are more inclined to visualize failure scenarios that undermine performance by dwelling on how things will go wrong (Bandura, 1989). In this study, the collective efficacy in heterogeneous pairs were proven to be less effective than individual efficacy of high efficacious students. In the process of pair collaborative writing, students' may use their linguistic knowledge to perform the scaffolding together which is termed as collective scaffolding (Storch, 2002, 2019). In this research, where students were paired based on their level of self-efficacy in writing, the short-term collective scaffolding was performed best by high-high self-efficacy pairs compared to the heterogeneous pair. It was seen from the quality of the essay produced.

In terms of the students' attentional preferences on the aspect of writing, i.e., content, organization and language use, the findings in all phases of this study showed that the students focused on the content quality of their writing. Most of the comparison showed that a pair or individual with better writing quality gained a higher content sub-score. This finding supports the statement of the Trade-off *hypothesis* (Amiryousefi, 2017; Skehan & Foster, 1997; Vanpatten, 1990), where the students tend to focus more on improving the content of their writing rather than the other two dimensions, organization and language use.

### CONCLUSION

Based on the findings and discussion presented in the previous chapters of this study, several conclusions that can be drawn. First, the students who write collaboratively in homogeneous pairs tend to produce better writing quality than those who write individually regardless of their self-efficacy level. Second, no evidence was found to suggest that the students with a high level of self-efficacy could produce better writing quality than those with a low level

of writing self-efficacy. Third, the students with high levels of self-efficacy who write individually tend to produce better writing quality in the aspects of content and language use compared to the writing they produce when they are asked to write with low self-efficacy students. Fourth, in terms of writing product quality, the homogeneous pairs of high-high self-efficacy students outperformed the homogeneous pairs of low-low self-efficacy students and also the heterogeneous pairs of high-low self-efficacy students. A homogeneous pair of high-high self-efficacy students resembles a highly collaborative pair, that could perform equal and mutual interactions, which might be beneficial for them to accomplish the writing task successfully.

This study contributes to the practice of English language teaching for the EFL learner by providing two main suggestions. First, since working collaboratively will produce better results when the pair consists of students with equal self-efficacy level, teachers should be aware of the individual traits of their students prior to asking the students to work collaboratively in pairs. And second, for the purpose of learning, heterogeneous pairs are recommended, as the heterogeneous condition resembles the scaffolding mechanism of learning. Whereas, for the purpose of assessment, teachers are suggested to arrange the students to homogeneous pairs to minimize the possibility of evaluation error, since based on the result of this study, students could show their best performance when they are paired with equal self-efficacy peers.

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### **INFORMED CONSENT STATEMENT**

Participation in this study was fully voluntary. Before taking part, all participants were informed about the purpose of the study, the procedures involved, and any possible risks and benefits. They were also assured that their personal identities would remain confidential and that the information they provided would be used only for research purposes. In addition, participants had the right to withdraw from the study at any time without penalty. Their continued participation indicated their informed consent under these conditions.

### **DATA AVAILABILITY STATEMENT**

The data used in this study are not publicly available because the researchers must protect participant privacy and follow ethical research standards. Restricting public access helps ensure confidentiality and compliance with data protection requirements. However, access to the dataset may be requested for validation or further analysis. Any request will be reviewed individually, and data may only be shared with approval from the relevant institutional ethics review board to ensure that the intended use is consistent with ethical guidelines and participant consent.

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