

Enhancing Second Language Learners' Writing through a Process-Genre Approach: A Multidimensional Analysis of Complexity, Accuracy, and Fluency Development

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Abstract

This study investigated the effects of the Process-Genre Approach on Chinese polytechnic English as a Second Language learners' writing performance, focusing on lexical and syntactic complexity, accuracy, and fluency. The research addresses the need for effective writing instruction in polytechnic education. Ninety-two low-intermediate learners from two intact classes participated in a 9-week intervention. The treatment group (n = 46) received a process-genre instruction, while the control group (n = 46) followed a conventional product-oriented instruction. The quantitative analysis measured complexity through lexical density, type-token ratio, lexical sophistication for lexical complexity, as well as sentence length, dependent clauses, coordinate phrases for syntactic complexity. Accuracy was assessed by four error types (syntactic, morphological, preposition, and spelling), and fluency was gauged by total word count and words produced per 30 minutes. Pre-post comparisons showed significant improvements within the treatment group across all dimensions. Between-group analysis revealed superior gains in fluency and complexity for the treatment group over the control group. In contrast, there was no significant difference in accuracy across the two groups. These results suggest the process-genre approach enhances fluency and complexity but may require additional form-focused instruction to improve accuracy. The study contributes to writing pedagogy by demonstrating how the process-genre approach can be optimized to support multidimensional writing development in polytechnic education contexts.

Keywords: Accuracy, complexity, fluency, process-genre approach, writing performance

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Introduction

Over the past three decades, Second Language (L2) writing pedagogy has undergone significant transformation, moving from the product approach to the process approach, and later to the genre approach (Zhang, 2016). The Process-Genre Approach (PGA), which Badger and White (2000) initially proposed, emerged as a synthesis of these earlier approaches, combining the form focus of the product approach, the recursive nature of the process approach, and the sociocultural orientation of the genre approach. This integrative approach has been acknowledged as effective in improving learners' writing performance across various learning contexts (e.g., Chen & Su, 2012; Huang & Zhang, 2020; Truong, 2022; Rahimi, 2024; Zhang et al., 2024).

While the PGA offers a comprehensive approach to teaching L2 writing, its impact on specific dimensions of writing performance—Complexity, Accuracy, and Fluency (CAF)—has yet to be thoroughly explored. CAF has long been recognized as a principal dimension of language proficiency and development (Pallotti, 2009; Norris & Ortega, 2009); with complexity referring to the sophistication and range of linguistic structures, accuracy grammatical correctness, and fluency the speed and ease with which language is produced (Skehan, 2009; Bui & Skehan, 2018). This tripartite framework allows for a nuanced understanding of learners' progress in writing, as Kuiken and Vedder (2019) outlined, making it particularly valuable in evaluating pedagogical approaches such as PGA. A few research employed a CAF analysis to examine how PGA influences learners' development and got mixed results (Barrot 2018; Alghizzi and Alshahrani, 2020; Mujtaba et al., 2023). Building on these findings, a more detailed CAF analysis could provide deeper insights into how the PGA contributes to specific aspects of language development.

CAF is particularly relevant in this study as it provides a multidimensional framework that captures not only the linguistic complexity and accuracy of learners' writing but also the fluency with which they compose. This makes it an ideal tool to assess how PGA holistically impacts learners' language development. Previous studies on PGA, such as Huang and Zhang (2020), and Truong (2022), have focused largely on general performance ratings. CAF together allows for a finer analysis of specific writing abilities that can shed light on the unique contributions of the PGA approach to L2 writing pedagogy. By using CAF analysis, this study will examine how learners' abilities evolve through PGA writing instruction, offering a deeper understanding of both the strengths and limitations of PGA in promoting writing proficiency.

Given limited research and mixed results surrounding the effects of PGA on the CAF dimensions, further research is needed to provide more comprehensive and definitive insights. Therefore, this study aims to examine the impact of the PGA on the complexity, accuracy, and fluency of L2 learners' writing, guided by the following research questions:

1. To what extent does the PGA improve L2 learners' writing performance across complexity, accuracy, and fluency?
2. How does the PGA compare to the conventional product approach in influencing complexity, accuracy, and fluency in L2 writing?

Review of the Literature

Analyzing CAF Development in L2 Writing

Complexity, Accuracy, and Fluency (CAF) are key indicators of language proficiency and development (Skehan, 2009). Since Wolfe-Quintero, Inagaki, and Kim's (1998) seminal review on syntactic complexity, accuracy, lexical complexity, and fluency, these dimensions have been extensively examined to assess L2 writing performance. CAF is now a well-established framework

for evaluating various aspects of L2 writing, particularly its ability to provide a detailed analysis of writing dimensions often overlooked by holistic rating scales (Li & He, 2015). Given its multidimensional focus on linguistic development, CAF is a robust tool for evaluating the effectiveness of pedagogical approaches such as the PGA on learners' writing performance.

While previous research has explored the merits of PGA in enhancing L2 learners' writing skills (e.g., Huang & Zhang, 2020; Truong, 2022; Rahimi, 2024), studies that utilize CAF analysis to evaluate the impact of PGA remain scarce. This gap is crucial, as CAF analysis can offer a nuanced understanding of how specific pedagogical practices shape different aspects of writing development (Kuiken & Vedder, 2019). Although a few studies examined the PGA's effects on CAF dimensions, the findings were inconsistent. For example, Barrot (2018) employed CAF analysis to investigate the effects of a PGA on L2 learners' writing. His study, which involved 66 pre-university intermediate L2 learners in the Philippines, found that the PGA group outperformed the control group regarding complexity and fluency. However, no significant differences were observed in accuracy. In contrast, Alghizzi and Alshahrani (2020) investigated the impact of PGA on the writing of advanced Saudi EFL undergraduates. Their study found no significant effects of PGA on complexity or fluency, though minor improvements in accuracy were noted.

These findings suggest that PGA may have a varying impact on specific aspects of writing, and the effects may vary across different learner groups, indicating the need for more targeted research. Moreover, existing studies on PGA have generally focused on individual CAF dimensions, such as complexity (Fu & Ibrahim, 2023), complexity and fluency (Yasuda, 2011), or accuracy (Peng & Barrot, 2023; Trang & Barrot, 2024). Few studies have examined all three dimensions simultaneously. Additionally, most PGA research has focused on intermediate or advanced learners' argumentative or research writing skills, with limited attention given to non-argumentative writing tasks among low-proficiency learners. This study seeks to address this gap by investigating the combined effects of PGA on complexity, accuracy, and fluency in the writing of low-intermediate learners engaged in workplace genres.

Rationale for Selected CAF Measures

The CAF measures used in this study were chosen based on their theoretical relevance and empirical validation in previous research. Complexity is the ability to use varied and sophisticated language structures (Ellis, 2009; Skehan, 2009). Earlier studies have typically examined two significant complexity facets: lexical and syntactic (Bulté & Housen, 2014; Lu, 2010). Building on previous research (e.g., Wolfe-Quintero et al., 1998; Lu, 2010, 2012; Yoon & Polio, 2017), measures of lexical density, corrected type-token ratio, and lexical sophistication were employed as indicators of linguistic complexity in this present study. In contrast, measures including mean sentence length, mean number of dependent clauses per clause, and mean number of coordinate phrases per clause were used as syntactic complexity indicators. These measures have been widely validated and effectively captured the multifaceted nature of linguistic complexity.

Accuracy, as Skehan (2009) illustrated, is an essential indicator of language proficiency, reflecting learners' ability to produce error-free language. Given the substantial number of texts requiring manual coding, this study adopted an error coding scheme outlined by Yoon and Polio (2017) to calculate the number of four error types, i.e., syntactic, morphological, prepositional, and spelling. Error rates per 100 words were counted as accuracy indicators to normalize for essay length. This approach ensures a fair comparison of error rates across essays of different lengths.

Fluency captures the pace and productivity of learners' writing (Skehan, 2009). It is

evaluated in this present study through total word count and words produced per 30 minutes, following Yoon and Polio (2017). Together, these measures (see Table One for a summary) provide a multidimensional assessment of L2 writing, making them well-suited to examining the interplay of complexity, accuracy, and fluency in learners' writing development.

Table 1. Complexity, fluency, and accuracy (CAF) measures used in this study

Construct	Measures and definitions
Complexity	Lexical Density (LD)
	Corrected Type/Token Ratio (CTTR)
	Lexical Sophistication (LS)
	Mean Length of Sentences (MLS)
	Dependent Clauses per Clause (DC/C)
	Coordinate phrases per clause (CP/C)
Accuracy	Syntactic errors per 100 words (SynE)
	Morphological errors per 100 words (MorE)
	Preposition errors per 100 words (PreE)
	Spelling errors per 100 words (SpeE)
Fluency	Total word count (TWC)
	Words produced per 30 minutes (WP30M)

Methodology

Research Design

This study utilized a quasi-experimental design with a pretest post-test approach. Due to the lack of random assignment, the study compared two intact groups of 92 low-intermediate Chinese polytechnic ESL learners: a treatment group ($n = 46$) receiving the PGA instruction and a control group ($n = 46$) continuing with conventional product-oriented instruction. The research aimed to measure changes in writing performance across three dimensions: complexity, accuracy, and fluency. The focus was to assess how PGA instruction influenced writing development compared to the traditional product method.

Participants

The study involved 92 English sophomores (ages 19-21) from two intact classes of a public polytechnic college in China. One class ($N = 46$) was randomly assigned to the experimental group, while the other ($N = 46$) served as the control group. All participants shared the same first language, Mandarin Chinese. To assess language proficiency, the participants' final exam scores from the previous semester's internally designed Comprehensive English course were utilized. This exam assessed comprehensive language skills, including reading comprehension, grammar, and writing. No significant difference ($p = .482$) in language proficiency was found between the two groups based on these scores.

Research Instruments

The primary instrument for data collection was a writing task in the form of a job application letter. The pretest and post-test used similar prompts, selected from an online test bank at the polytechnic college. The prompts were evaluated for clarity and relevance through a pilot study and reviewed by three experienced lecturers. To assess writing performance, the study employed a combination of manual error analysis and computational tools. Errors were categorized into syntactic, morphological, preposition, and spelling errors based on an error coding scheme

proposed by Yoon and Polio (2017). Additionally, syntactic and lexical complexity were measured using the L2 Syntactic Complexity Analyzer (Lu, 2010) and L2 Lexical Complexity Analyzer (Lu, 2012). Fluency was assessed based on word count and words produced per 30 minutes.

Data Collection

The experiment took place in an English writing class to enhance students' workplace writing skills, such as writing emails, reports, and notices. Both the treatment and control groups attended class for 1.5 hours per session, once a week, throughout one term. Before the intervention, an impromptu writing test was conducted to collect baseline data from both groups. The intervention started with week three and covered nine instruction sessions dealing with various email-writing tasks. Two weeks after the treatment, the participants were given the post-test. The writing prompts for the pretest and post-test were similar, in which the students were required to write a job application letter based on the prompts given. The pretest and post-test occurred in learners' classrooms during regular class time. The data collection was completed within the 14 week's duration.

Data Analysis

To assess whether there were any noticeable differences in complexity, accuracy, and fluency, the 184 texts produced by the two groups during the pretest and post-test were analyzed using the metrics given in Table One. Specifically, those texts were firstly checked manually by two raters counting the number of syntactic, morphological, preposition and spelling errors based on an error coding scheme used in Yoon and Polio (2017). Interrater reliability was assessed across all error categories: syntactic errors (.953), morphological errors (.916), preposition errors (.826), and spelling errors (.991), which yielded acceptable agreement levels (Cumming et al., 2005). To reduce the possible effect of text length, the study calculated the error rates per 100 words as the accuracy indicators. After drawing out the accuracy data, spelling errors were corrected, and all the texts were put into two computational systems, i.e., L2 Lexical Complexity Analyzer (Lu, 2012) and L2 Syntactic Complexity Analyzer (Lu, 2010), to induce complexity data. Fluency data was obtained by calculating the total number of words produced and words written per 30 minutes.

All data were analyzed using SPSS Version 27 to address the research questions quantitatively. Standard diagnostic tests and procedures were employed to ensure that the assumptions of statistical analyses were met. The normality of the data distribution was assessed through visual inspection of histograms as well as skewness and kurtosis values. At the same time, Levene's test was used to examine the homogeneity of variance. To evaluate changes between pre- and post-tests, paired-sample t-tests were conducted. Due to significant differences in specific pretest dimensions between the experimental and control groups, Analysis of Covariance (ANCOVA) was used to evaluate the difference in post-test scores, with pretest scores as covariates. Before conducting ANCOVA, the assumptions of linearity and homogeneity of regression slopes were tested to ensure the validity of using ANCOVA. The significance level (α) was set at .05. Bonferroni corrections were applied to minimize the risk of Type I errors when conducting multiple comparisons. Partial eta squared (η^2) was calculated to estimate effect sizes, with thresholds for interpretation based on Cohen's (1992) guidelines: η^2 values of .01, .06, and .14 were categorized respectively as small, medium, and large effect sizes.

Results

The results are provided to answer the two research questions. Descriptive statistics for learners' complexity, accuracy, and fluency (CAF) scores under the two conditions (experimental and control) in the pretest and post-test are presented in Table Two in the appendix A.

Assumptions of normality and homogeneity of variance were confirmed for all data sets. Baseline comparisons indicated that students' performance in nine out of the twelve CAF items did not differ significantly between the experimental and control groups before the intervention, including Lexical Diversity (LD) ($p = .365$), Mean Length of Sentences (MLS) ($p = .164$), Dependent Clauses per Clause (DC/C) ($p = .630$), Coordinate Phrases per Clause (CP/C) ($p = .525$), Syntactic Errors (SynE) ($p = .662$), Morphological Errors (MorE) ($p = .157$), Preposition Errors (PreE) ($p = .305$), Spelling Errors (SpeE) ($p = .124$), and Words Produced in 30 Minutes (WP30M) ($p = .931$). However, significant differences were found in pretest scores on three items: Corrected Type-Token Ratio (CTTR) ($p = .029$), Lexical Sophistication (LS) ($p = .006$), and Total Word Count (TWC) ($p = .002$). To assess within-group effects, paired-sample t-tests were carried out. As for between-group effects, ANCOVA was performed for complexity and fluency, using corresponding pretest scores as covariates to control for baseline differences. In contrast, an independent samples t-test was conducted for accuracy because two ANCOVA assumptions (i.e., linearity and homogeneity of regression slopes) were not satisfied.

The within-group comparisons, as shown in Table Three in the appendix B, revealed that the experimental group significantly improved their post-test scores in eleven out of twelve CAF items, except for Lexical Diversity (LD). The control group also improved considerably in seven CAF items, albeit with comparatively more minor gains over time. The subsequent sections will compare the effects of the intervention on complexity, accuracy, and fluency, both within and between groups.

Effects on complexity

The results of paired-sample t-tests in Table Three revealed significant improvements in five complexity components for the intervention group over time (pre- vs. post-test): Corrected Type-Token Ratio (CTTR) ($p = .000$), Lexical Sophistication (LS) ($p = .000$), Mean Length of Sentences (MLS) ($p = .000$), Dependent Clauses per Clause (DC/C) ($p = .009$), and Coordinate Phrases per Clause (CP/C) ($p = .000$). The control group also showed significant improvements in three complexity components over time: CTTR ($p = .000$), MLS ($p = .001$), and CP/C ($p = .005$).

Given that the pretest complexity scores between the two groups demonstrated significant differences in two out of six items (CTTR, $p = .029$; LS, $p = .006$), ANCOVA was conducted to compare post-test scores while controlling for pretest scores in the two items as covariates. The results, shown in Table Four, indicated that the intervention group outperformed the control group significantly on CTTR ($p = .000$), with a large effect size ($\eta^2 = .194$), and DC/C ($p = .000$), with a medium to large effect size ($\eta^2 = .130$). However, no significant difference was observed between the groups on the remaining four variables: LD ($p = .466$), LS ($p = .075$), MLS ($p = .078$), and CP/C ($p = .376$).

Table 4. ANCOVA results comparing complexity measures by two groups

Variable	F	P	partial η^2
LD	.537	.466	.006
CTTR	21.116	.000**	.194
LS	3.256	.075	.036

MLS	3.179	.078	.035
DC/C	13.139	.000**	.130
CP/C	.791	.376	.009

Note. EG=experimental group; CG=control group; **p<.01

Effects on Accuracy

The analysis of accuracy measures presented a different trend for the treatment and control groups. As shown in Table Three in the appendix B, simple effects analysis revealed a significant reduction in error frequency in both groups, with the intervention group showing significant decreases in four types of errors: Syntactic Errors (SynE) ($p = .001$), Morphological Errors (MorE) ($p = .000$), Prepositional Errors (PreE) ($p = .017$), and Spelling Errors (SpeE) ($p = .000$). In contrast, the control group demonstrated significant reductions in only two error types: MorE ($p = .001$) and SpeE ($p = .000$).

Pretest scores for the four accuracy measures were comparable across the two groups: SynE ($p = .662$), MorE ($p = .157$), PreE ($p = .305$), and SpeE ($p = .124$). Similarly, post-test between-group comparisons, as illustrated in Table Five, indicated no statistically significant differences in any of the four accuracy measures: SynE ($p = .327$), MorE ($p = .140$), PreE ($p = .448$), and SpeE ($p = .527$).

Table 5. Independent samples T-test results of four accuracy measures between EG and CG

Variable	t	P
SynE	-.985	.327
MorE	-1.488	.140
PreE	-.762	.448
SpeE	.635	.527

Effects on Fluency

The within-group analysis of fluency measures (see Table Three in the appendix B) indicated significant improvements for both groups from the pretest to the post-test. For the intervention group, substantial gains were observed in both fluency measures: Total Word Count (TWC) ($p = .000$) and Words Produced in 30 Minutes (WP30M) ($p = .000$). Similarly, the control group also demonstrated significant improvement in: TWC ($p = .000$) and WP30M ($p = .003$).

Baseline comparisons revealed a significant difference in TWC between the two groups at the pretest stage ($p = .004$), with the intervention group scoring lower. However, post-test results (see Table Six) showed that the intervention group outperformed the control group significantly in both measures: TWC ($p = .000$) and WP30M ($p = .000$). Both variables demonstrated substantial effect sizes: TWC ($\eta^2 = .264$) and WP30M ($\eta^2 = .259$), indicating a strong positive impact of the intervention on fluency.

Table 6. ANCOVA Results Comparing TWC between EG and CG

Variable	F	P	partial η^2
TWC	31.891	.000	.264
WP30M	31.064	.000	.259

Discussion

Within-Group Differences in CAF Development

In response to the first research question, the study demonstrates that the PGA significantly improved all three dimensions of writing—complexity, accuracy, and fluency—in the treatment group. These findings align with prior research such as Huang and Zhang (2020), and Rahimi (2024), who also reported positive effects of PGA on writing performance. However, this study extends the existing literature by showing concurrent improvements across all CAF dimensions, a result not often seen in previous studies (Barrot, 2018; Alghizzi & Alshahrani, 2020), and those focused on isolated aspects of writing performance (e.g., Yasuda, 2011, Fu & Ibrahim, 2023).

The most pronounced improvement was observed in complexity. Learners in the PGA group demonstrated a noticeable shift from basic vocabulary and sentence structures to more sophisticated and formal expressions in their post-test writings. This change can be attributed to the explicit and communicative nature of PGA, which emphasized context-specific language use and guided learners through the modeling and deconstruction stages. These stages provided learners with tools to express more complex ideas, as evidenced by the increased use of formal phrasing such as "I would be obliged if..." and more sophisticated expressions (e.g., qualified, intelligent) in their post-test job application letters. This result is consistent with previous research (Yasuda, 2011; Barrot, 2018; Fu & Ibrahim, 2023), showing that PGA fosters greater complexity in writing. However, the inherent limitations of the job application letter genre, which restricts lexical and syntactic variation, may explain why improvements in lexical density were not as pronounced, suggesting a need for further research on how different genres influence lexical complexity.

Regarding accuracy, the study found significant improvements in the PGA group. This gain can be attributed to the model text analysis phase of the PGA instruction, where learners were led to attend to the topic-specific expressions and understand them within specific contexts. The improvement in accuracy supports findings from Trang and Barrot (2024), Peng and Barrot (2023), which emphasized integrating form-focused instruction into PGA for enhancing grammatical precision. For instance, pretest errors like "I am very interested" were corrected in post-test writings to more accurate forms like "I am writing to apply for...". These results suggest that PGA's genre-specific focus can enhance grammatical accuracy, mainly when learners are guided through explicit model analysis focusing on topic-specific expressions.

Fluency also improved significantly, as evidenced by increased word count and greater text coherence in the PGA group. This finding is consistent with the results of Barrot (2018) and Yasuda (2011), who found that PGA enhanced fluency. The improvement in fluency is likely due to the learners' increased familiarity with rhetorical structures and organizational patterns, which were introduced during the modeling phase and later reinforced through joint and independent construction stages. These recursive stages helped students reduce cognitive load, enabling them to write more fluidly and coherently. The pre-writing activities, such as contextual analysis and planning, also encouraged students to focus on content and organization, further enhancing fluency. These results contrast to Alghizzi and Alshahrani (2020), who observed minimal fluency gains, suggesting that PGA's effectiveness may vary depending on the learner's proficiency and task context.

The most significant contribution of this study is the demonstration of simultaneous improvements across all three CAF dimensions. While previous studies (e.g., Yasuda, 2011; Fu & Ibrahim, 2023) have shown improvements in isolated dimensions, this study provides compelling

evidence that PGA can foster balanced development in complexity, accuracy, and fluency. These findings challenge the trade-off hypothesis, a term stated in Skehan (1998), which posits that focusing on one dimension may hinder progress in others. Instead, the results suggest that a well-structured approach like PGA can support concurrent development across these key writing dimensions, highlighting its potential as a comprehensive pedagogical tool.

Between-Group Differences in CAF Development

In response to the second research question, the study compared the effectiveness of PGA with the conventional product approach in enhancing complexity, accuracy, and fluency. The findings revealed that while both groups improved in writing, the PGA group outperformed the product approach group in terms of complexity and fluency. In contrast, the two groups showed similar gains in accuracy.

Regarding complexity, the PGA group demonstrated significantly higher values in CTTR ($F = 22.116, p = .000$) and DC/C ($F = 13.139, p = .000$), indicating more significant development in lexical diversity and the density of content words compared to the product approach group. These findings align with Barrot (2018), Alghizzi and Alshahrani (2020), Fu and Ibrahim (2023), who also reported that PGA promotes greater complexity in writing. The lack of significant differences in other complexity measures (e.g., lexical sophistication, mean length of T-unit) may be due to the relatively short duration of the intervention (9 weeks), which aligns with Ortega's (2003) argument that measurable complexity improvements typically require a more extended period of instruction (up to 12 months).

Regarding accuracy, while the PGA group showed improvements across all accuracy measures, these gains were not statistically significant compared to the control group. This finding suggests that the product approach, which emphasizes language practice and corrective feedback, also plays a critical role in improving accuracy. These results are consistent with previous studies, highlighting the impact of corrective feedback and Form-Focused Instruction (FFI) on L2 writing accuracy (Hartshorn et al., 2010; Trang & Barrot, 2024; Peng & Barrot, 2023). Therefore, the lack of significant differences in accuracy may reflect the complementary role of form focus and corrective feedback in both approaches.

Fluency, however, showed a significant advantage for the PGA group, with higher word counts (TWC, $p = .000$) and words per 30 minutes (WP30M, $p = .000$) compared to the control group. This result aligns with previous research by Yasusa (2011) and Barrot (2018), who found that PGA positively affects fluency. The fluency improvements can be attributed to several features of the PGA approach. For instance, the modeling stage may have heightened learners' awareness of linguistic forms, while the subsequent joint and independent construction stages likely facilitated their internalization and application of these forms. The recursive writing stages have familiarized learners with the structural and organizational patterns of target texts, thereby promoting fluency. Furthermore, the emphasis on pre-writing activities, including contextual analysis and planning, encouraged learners to focus on ideas and organization over form, thereby enhancing fluency.

Conclusion

This study examined the effectiveness of the Process-Genre Approach (PGA) in enhancing L2 learners' writing performance, focusing on the dimensions of complexity, accuracy, and fluency (CAF), at a polytechnic college in China. The within-group analysis revealed significant

improvements in all three CAF dimensions for the PGA group. In contrast, the between-group comparison showed that the PGA group made more substantial gains in writing complexity and fluency than the product-focused group. At the same time, improvements in accuracy were comparable between the two groups.

These results suggest that the PGA is particularly effective in fostering complexity and fluency, likely due to its emphasis on iterative writing processes, cooperative learning, and genre-specific language structures. These findings align with previous research on the positive impact of explicit instruction and contextual learning on writing (e.g., Ahmadi et al., 2013; Barrot, 2018; Huang & Zhang, 2020). The absence of significant differences in accuracy between the groups indicates that additional, targeted interventions—such as integrating form-focused instruction (FFI)—may be necessary to achieve more substantial improvements in accuracy, as proposed by Trang and Barrot (2024), Peng and Barrot (2023).

This study also underscores the interconnected nature of the CAF dimensions, raising essential questions about whether simultaneous improvement across all three dimensions is achievable. While the PGA proved effective in enhancing fluency and complexity, further refinements to the instructional design may be required to achieve balanced progress across all dimensions.

Implications and Future Directions

This study highlights the potential of the PGA to improve L2 learners' writing, particularly in terms of complexity and fluency. However, the lack of significant gains in accuracy suggests that integrating explicit Form-Focused Instruction (FFI), along with structured language practice and corrective feedback, would optimize the development of all three CAF dimensions.

Several limitations should be considered. The 9-week duration of the intervention and its exclusive focus on workplace genres may restrict the generalizability of the findings. Future research should extend the intervention period to examine the long-term impact of the PGA on writing performance. Furthermore, expanding the study to include a broader range of writing genres, such as narrative and argumentative writing, would provide a more comprehensive understanding of the PGA's applicability across different writing contexts.

Additionally, exploring the effectiveness of the PGA in different learner contexts—such as with low-intermediate versus advanced learners—could reveal critical factors influencing its success. This would offer valuable insights into how the PGA can be adapted to meet the specific needs of diverse learner groups. By refining the PGA to accommodate these factors, its potential as a dynamic and practical approach to L2 writing instruction can be maximized.

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Appendices

Appendix A

Table 2. Descriptive statistics of CAF measures at pretest and post-test

			Pretest		Post-test	
Components		Group	Mean	SD	Mean	SD
Complexity	LD	EG	.50	.04	.50	.03
		CG	.49	.04	.50	.05
	CTTR	EG	4.32	.53	5.17	.46
		CG	4.57	.56	4.93	.50
	LS	EG	.15	.06	.20	.05
		CG	.18	.05	.19	.05
	MLS	EG	9.78	2.06	12.53	2.30
		CG	10.44	2.43	11.87	2.86
	DC/C	EG	.19	.12	.24	.09
		CG	.18	.10	.18	.09
	CP/C	EG	.14	.11	.25	.12
		CG	.1547	.11	.2298	.17
Accuracy	SynE	EG	2.74	1.84	1.83	1.06
		CG	2.58	1.62	2.09	1.42
	MorE	EG	3.49	2.26	1.46	1.16
		CG	2.86	2.01	1.84	1.32
	PreE	EG	1.09	1.46	.53	.69
		CG	.82	1.05	.64	.70
	SpeE	EG	1.75	1.57	.77	.95
		CG	2.30	1.84	.66	.82
Fluency	TWC	EG	99.85	26.96	155.33	38.77

	CG	119.56	32.69	138.70	40.18
WP30M	EG	117.72	34.67	159.76	39.15
	CG	117.15	27.70	130.73	33.19

Note. EG=Experimental group; CG=Control group; SD=standard deviation.

Appendix B

Table 3. *Within-subject comparisons from paired samples T-test results*

Subjects		Pre-vs. Post-test					
		EG			CG		
		Gain	t	P	Gain	T	P
Complexity	LD	+.00	.695	.490	+.01	1.455	.153
	CTTR	+.85	12.195	.000**	+.36	5.678	.000**
	LS	+.05	5.640	.000**	+.01	1.335	.189
	MLS	+2.74	5.723	.000**	+1.42	3.527	.001*
	DC/C	+.05	2.712	.009*	+.00	.020	.984
	CP/C	+.11	4.935	.000**	+.08	3.094	.003*
Accuracy	SynE	-.91	-3.656	.001*	-.50	-1.746	.088
	MorE	-2.03	-6.738	.000**	-1.01	-3.677	.001*
	PreE	-.56	-2.469	.017*	-.18	-1.116	.270
	SpeE	-.97	-3.874	.000**	-1.65	-6.712	.000**
Fluency	TWC	+55.48	12.524	.000**	+19.11	4.985	.000**
	WP30M	+42.04	6.386	.000**	+13.58	3.347	.002*

Note. EG=experimental group; CG=control group; **p<.01; *p<.05