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FULL LENGTH ORIGINAL ARTICLE

Effects of Corpus-Based Instruction on Students' Academic Writing Development and Their Perceptions toward Learning with Corpora: *A Focus on Self-Compiled Corpora*

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Abstract

This study aimed to examine the effect of corpus-based instruction (CBI) on EFL learners' academic writing development and their perceptions toward CBI, on third-year Software Engineering students (N = 50) of Woldia University, Ethiopia in 2024. Mixed-methods approach with an interrupted time series quasi-experimental research design was employed. For the 36-hour classroom intervention, a self-compiled corpus of 200 IELTS Band 9 essays was exploited with AntConc software. The data gathering tools used in the study were Test scores, a questionnaire, and semi-structured interviews . Using, an explanatory sequential data analysis technique, a paired samples t-test, percentage, and mean were used using SPSS version 26 for quantitative data and thematic analysis fot qualitative ones. The analysis revealed significant statistical differences in all pairs of posttest scores at a value of p=.000. Besides, low, medium, and high scorers' posttset writing performance showed a mean difference of 37.35, 29.41, and 14.82, respectively, from their initial test achievements. These findings indicate that CBI effectively enhanced academic writing, especially for low and medium scorers. Participants also expressed positive views on CBI's role in grammar and vocabulary development, despite its moderate impact on task achievements and text coherence. However, further studies shall be done on different academic writing genres.

Keywords: Academic writing development; AntConc software; corpus-based instruction; perception

1 INTRODUCTION

1.1 Background of the Study

Academic writing is a well-structured, organized, accurate, and evidence-based written text that conveys messages to different audiences, and it is a very common practice in higher education settings like colleges and universities (Durrant, 2022). However, some challenges hinder readers' understanding of the intended meaning due to several writing difficulties (Yangın-Ekşi et al., 2023). Among several challenges of teaching academic writing, the impacts of cognitive, individual, pedagogical, and psychological issues have been shown as central concerns (Bailey, 2017).

Moreover, a lack of genre awareness, syntactic knowledge, lexical awareness, and modern technology utilization remains as major difficulties of academic writing instruction (Durrant, 2022). To minimize these difficulties of EFL learners at higher education level approaches to teaching writing: product, process, genre, and process-genre have been employed for several decades, even though the problem persists (Bondi, 2014; Flowerdew, 2010).

In academic writing instruction, producing quality essay/genre types like argumentative, expository, narrative, and explanatory is an important issue. For each essay type, grammar accuracy, vocabulary usage, text coherence and cohesion, and task achievements are the four common quality assessment criteria (Bailey, 2017). Nowadays, as an alternative approach, the corpus-based instruction (CBI) has become more popular in the field of academic writing pedagogy (Durrant, 2022). Due to the advancement of technology, the previous Data-Driven Learning (DDL) has been benefited, and the EFL researchers, teachers, and learners have shown a positive interest in applying it for academic writing teaching and learning purposes indirectly (i.e., without internet access). As a form of DDL, students can access diverse authentic materials, correct errors, and receive feedback to address their writing difficulties using written corpora (Leech, 2014; Luo & Liao, 2015; Oshima & Hogue, 2007).

For many authors like Anthony (2017), Durrant (2022), and Tribble (2001), a corpus (plural-corpora) is a collection of written or spoken texts that can be used directly (i.e., direct approach) or indirectly (i.e., indirect approach) as language inputs in teaching different language skills. For direct use of corpora, EFL learners and teachers can exploit corpus data through online concordance tools. For a direct approach (on-hand), lots of online corpora have been manipulated and used for EFL research and pedagogy purposes (Durrant, 2022; Zhao, 2015). For indirect use, corpus data can be used for instructional and research purposes without internet access, applying different software like AntConc, MonoConc, WordSmith, and printouts (Anthony, 2005; Le Foll, 2021). According to Zhao (2015), among many others, the British National Corpus (BNC), the Michigan Corpus of Academic Spoken English (MICASE), and the Corpus of Contemporary American English (COCA) are the most commonly known types of corpora that EFL teachers, learners, and researchers can use for their particular purpose. On the contrary, there are some opponents to using these general and specialized corpora. For Zhao (2015), managing and using a large number of corpora for specific purposes is difficult. On the other hand, getting adequate and appropriate corpora is another challenge (Le Foll, 2021). Since corpus data is fragmented and decontextualized, it also lacks context. Moreover, using CBI consumes more time (McCarten, 2010).

However, due to the advancement of computer technology, a "corpus of written language texts can be entered into a computer by scanning, typing, downloading from the internet or by using files that already exist in electronic form" so that EFL teachers and researchers can bring authentic texts in the actual classroom that can minimize all the aforementioned challenges (O'Keeffe et al., 2007). In this regard, according to Anthony (2005), self-complied corpora are relatively focused, tailored, and manageable. They can be collected and prepared systematically from one or more sources to be exploited using a computer through user-friendly, freely available software, i.e., AntConc, through its concordance tools, without internet access (Anthony, 2017). In the field of academic writing, though it needs certain investigation before its actual application in a particular learning context, the International English Language Testing Standards (IELTS), Writing Task I test takers' responses (Note: we used freely available texts for some ethical issues) seem to be a potential resource for future academic writing instruction (Smirnova, 2017). Hence, the current researchers realized that self-complied corpora can be collected from the IELTS and prepared in line with Anthony (2017) guidelines.

Among various academic writing essays, comparing and contrasting is the most challenging and a daily practice for higher education learners. Compare and contrast academic essay writing needs relatively factual or objective evidence, rational and critical analysis skills over other types of essays (Bailey, 2017). Therefore, due to the objective and authentic nature of Writing Task I test responses, we believe that the compare and contrast essay writing development might benefit more and highlight better insights regarding the use of corpora. Hence, this study aimed to explore how IELTS Writing Task 1 Band 9 responses as a self-compiled corpora affect EFL learners' development of academic essay writing and their perceptions toward learning with corpora in the context of Woldia University, Ethiopia.

1.2 Statements of the Problem

Research findings indicate that CBI significantly promotes academic writing development of EFL learners and prompts researchers and teachers to explore effective strategies with several inconsistencies. For instance, recent studies (Durrant, 2022; Hu & Deng, 2023) found that CBI enhances lexical diversity and complexity, with learners appreciating these methods regardless of their performance levels. Alsehibany and Abdelhalim (2023) noted significant improvements in vocabulary use among students at a Saudi university who engaged directly with corpora. While students generally favor learning vocabulary through direct corpus interaction (Boulton, 2009; Sinha, 2021; H. Yoon & Hirvela, 2004), high performers appear to benefit more than lower performers (Boulton, 2009; Mostafa et al., 2018). On the contrary, Duan et al. (2022) highlighted that CBI was more important for beginners than advanced learners.

The EFL learners' perceptions toward the teaching methods, materials, and the overall situation would vary and affect their learning outcomes positively or negatively. Most research findings revealed that learners have positive perceptions of CBI. However, researchers Amjadiparvar and Shafie (2021) found that learners had positive perceptions of the collaborative use of CBI, and Boulton (2009)) explored that students liked it for autonomous learning. Besides, the research findings of Alsehibany and Abdelhalim (2023), Boulton (2009), Durrant (2022), Hu and Deng (2023), and Sinha (2021) show that EFL learners were interested and had positive perceptions toward corpus-mediated vocabulary learning over grammar items. In addition, Boulton (2009) and Mostafa et al. (2018) revealed that even though all of their targeted EFL learners were positive on their respective corpus-based EFL academic writing learning, high-performing learners benefited more than low-performing ones. Likewise, Tsai (2021) examined the effect of online CBI on business English writing instruction in terms of vocabulary, syntactic structure, and content as a whole was significant, and learners showed positive perceptions toward the intervention.

In the context of Ethiopian universities, local research findings revealed that academic writing has remained as one of the most challenging tasks for EFL learners (Fenta et al., 2018). As a result, Amare (2022) examined the effects of CBI on Bahir Dar University mechanical engineering students' argumentative essay writing development and their perceptions toward learning with corpora. He applied a one-time pre- and post-test for measuring the participants' writing achievements. Then, his findings indicated that CBI resulted in significant writing improvement, and the target students had shown positive perceptions on the intervention. However, a relatively long period of intervention and repeated assessment of tests might have been done to identify the most challenging writing difficulties and significant changes in the participants' writing improvement and perceptions. Assessing the impacts of a relatively prolonged educational intervention using repeated tests can evaluate learners' progress effectively Subedi (2016). As a result, we, the current researchers, have argued that the above Amare (2022) research findings might vary if the frequency of tests were increased for a relatively longer time intervention.

Additionally, before the beginning of the actual intervention of this study, a preliminary assessment we conducted with 150 randomly selected undergraduate students at Woldia University revealed that over 90% (N=136) were incompetent in their writing quality, scoring below 15% on compare-and-contrast essays in their final exams. Based on the preliminary assessment and our real teaching experiences, it can be argued that despite significant academic writing challenges among EFL learners, Ethiopian universities have largely overlooked the potential of self-compiled CBI as a moderate alternative type of instruction to improve writing skills. Based on the assessments we made, there are no significant efforts to utilize IELTS test responses and questions as a written corpus, aided by AntConc software with no internet access.

To sum up, previous research mainly focused on investigating direct use of general and specialized corpora that will not be practical in the absence of an internet access, and getting sustainable internet access for each learner is the most challenging thing for developing countries like Ethiopia. According to the research findings of Mulatu and Mandefro (2021), in most Ethiopian contexts, the dependence on online instruction poses accessibility challenges for learners, especially in environments with limited/no internet access. Besides, even though Ethiopian university students have shown serious academic writ-

ing challenges, we realized that need-based and tailored self-compiled corpora had never been given attention as an alternative way of instruction. On the other hand, studies show that the effect of CBI on academic writing development is not consistent. Some studies revealed that CBI is effective for grammar and others for vocabulary instruction, with diverse perceptions. Most researchers left their focus on text coherence and cohesion, and task achievement development in the target text. Similarly, some research findings indicated CBI is more beneficial for high writing performance level EFL learners, and some others ensured it is useful for low and medium performance level ones.

Therefore, this study aimed to address the identified gaps and offer further insights into a standardized, self-compiled CBI for developing writing of compare-and-contrast essays and learners' perceptions toward their learning with the target corpora.

Based on the purpose of the study, the following research objectives were designed

1. To investigate how corpus-based instruction differentially impact students' writing development across four text quality criteria: grammatical range and accuracy, vocabulary, task achievement, and cohesion & coherence
2. To examine the effect of corpus-based instruction on EFL learners with varying levels of writing performance in enhancing their academic writing skills
3. To assess how students perceive learning to write through corpus-based instruction

1.3 Theoretical Frameworks

In EFL academic writing instruction, the Theory of Constructivism (CT) mainly pays attention to how individuals construct certain knowledge (i.e., a focus on individual cognitive process) through experiences (Jonassen & Rohrer-Murphy, 1999) On the other hand, the Sociocultural Theory (ST) strongly advocates that learning is highly influenced by both individual cognition and social context and interaction (Yaakob, 2014). Besides, Activity Theory (AT) relies on how tools mediate activities and changes learning outcomes with interactions among activity system components like subjects, objects, tools, and community (Engeström, 2009).

Despite their differences of emphasis, the three frameworks shared concepts like the significance of active learning, social interaction, and contextual learning. Besides, for all frameworks, learning is considered a process of constructing knowledge (constructivist approach) through interactions and experiences of learners. However, unlike the concepts of the two theories (constructivism and sociocultural), AT enables to identification of the contradictions among activity system components within the process of writing instruction and enables taking possible actions (Isssroff & Scanlon, 2002). It was also proved that AT is supported by the principles of DDL and can serve as a foundation for studying technology-assisted instruction in higher education to address EFL learning challenges, including academic writing (McCarthy & McCarten, 2022; Yaakob, 2014).

In a constructivist learning environment (CLE), context-based human activity and consciousness interaction concern the learning design process and performance (Jonassen & Rohrer-Murphy, 1999). Since, CLE is "a place where learners may work together and support each other as they use a variety of tools and information resources in their pursuit of learning goals and problem-solving activities (Yaakob, 2014), AT fits the principles of DDL and initiates productive interactions between learners and instructional materials in a constructivist and technology-enhanced environment to better learning outcomes (Engeström, 2009). Again, CBI also promotes technology-assisted real language, autonomous, motivation, and activity-based learning (Boulton, 2009; McCarthy, 2001; Yaakob, 2014). Based on the principles of AT, language learning requires a socially constructed formal environment with shared roles, well-designed learning goals, and tools in line with learners' backgrounds (Engeström, 2009; Hardman, 2008).

Therefore, it can be argued that either individually or in groups, EFL learners can interact with the corpus data to find target language inputs from the patterns of concordance lines, edit their draft, cor-

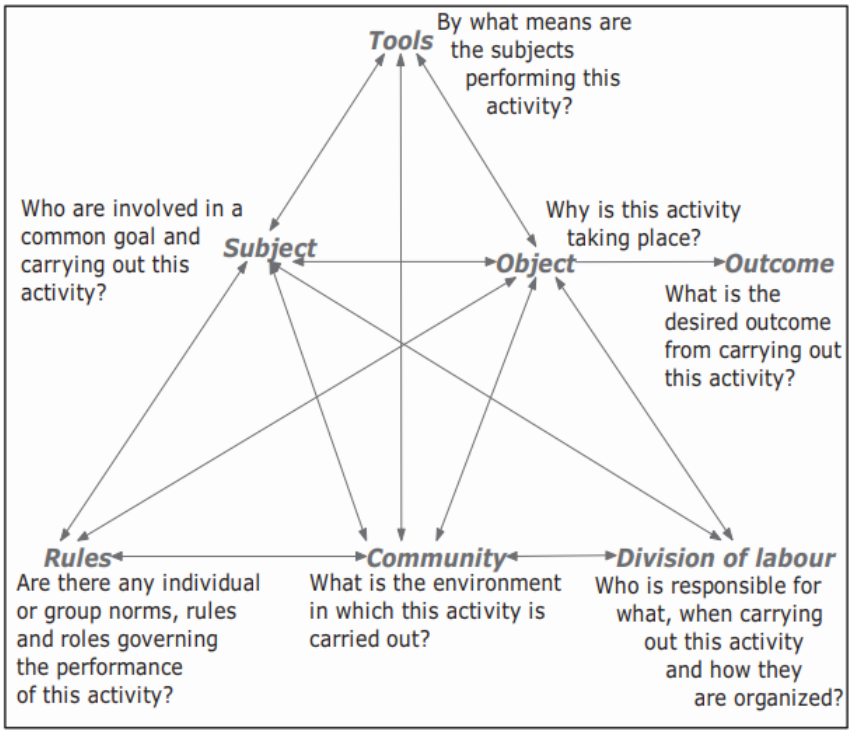

Figure 1: Engestrom's (2009) expanded Activity Theory Model used for the present study

rect or revise, and provide feedback to their colleagues using the AntConc software. Since the main objective of this study is investigating effects of CBI (i.e., the tools), it is guided by the principles of AT using Engeström (2009) expanded AT Model based on activity system components, which include tools, subjects, rules, community, division of labor, objects, and outcomes (see the detail in Figure 1). In line with the principles of DDL, AT supports all the analysis of learning environment based on the specific Activity System components, like uses of the tools (AntConc software, self-compiled corpora), subjects (study participant learners, the instructor), community (Woldia University), rules (writing instructions and assessment criteria), division of labor (tasks given to the learners and the instructor), and outcomes (short-term and long-term) of the instruction measured at all levels of tests (i.e., pre-tests, post-tests, and the delayedposttest).

1.4 Conceptual Frameworks

Based on the review of literature, previous research finding, objectives of the current study, and concepts of AT, the following conceptual framework was drawn to clarify both the dependent and the independent variables.

As shown in Figure 2, the CBI is mainly characterized by the use of self-compiled corpora with the assistance of computers and the AntConc software throughout the actual intervention classes. In the classroom intervention, the researcher (i.e., the corresponding author) used both the self-compiled corpora and model printouts (i.e., off-hand materials) under the guidance of the Teaching Learning Cycle (TLC) instructional model. For this intervention, the TLC was selected due to its flexibility and the nature of its genre-oriented approach. A diagnostic test was administered to identify the participants' performance level and to prepare instructional materials accordingly. At the end of each intervention round, the effects of the intervention (i.e., the dependent variables: writing development and perceptions) were investigated in relation to the intervention rounds (i.e., the independent variables: the CBI

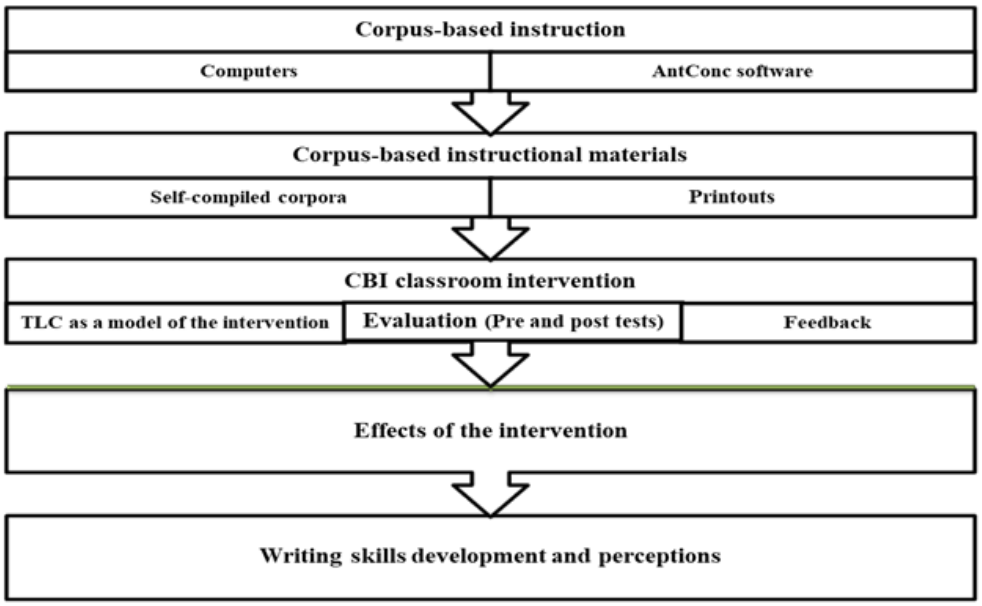

Figure 2: Conceptual framework of the study

given at different time intervals) after the diagnostic/pre-tests: post-tests, and delayed-post-test.

2 METHODOLOGY

2.1 Pedagogical Setting and the Study Participants

Woldia University, a government institution in Ethiopia's Amhara region, was chosen for this study due to its schedule appropriateness, and availability of computers. After securing permission from the Department of Software Engineering through a formal letter, the researchers met with some instructors a head to explain the study objectives, and the implementation plan. At the very beginning, all the available 55 third-year Software Engineering students (23 females) in the year of 2024 were conveniently selected based on their class schedules appropriateness and availability of adequate number of computers in the department. However, only 50 students (21 females) fully attended the entire intervention classes, and five students withdrawn from the study due to their personal reasons.

2.2 The Study Design

Due to the nature of the research objectives, a pragmatist worldview guided this study. Therefore, a mixed-research method incorporating both quantitative and qualitative data was applied to triangulate the data and increase the validity and reliability of research findings (Morgan, 2007). To investigate the effect of the independent variable (the intervention) on the dependent variable (the participants' writing development and perceptions) with a set of repeated tests (i.e., two pre-tests, two post-tests, and one delayed post-test), an interrupted time series quasi-experimental research design (ITSQERD) was employed. The ITSQERD advocates that periodically repeated tests are used to examine the progress in students' writing development (Creswell, 2014).

As a result, the research design for the current study was adapted as shown in Figure 3 below.

$$\underbrace{\text{PT1} - \text{x} - \text{PT2}}_{\text{APT}} - {}^{*}\text{R1-CBI} \implies \text{PoT1} - {}^{**}\text{R2-CBI} \implies \text{PoT2} + \text{PI} - \text{X} \implies \text{DPoT}$$

Figure 3: An interrupted time series quasi-experimental research design for a single treatment group (adapted from Chiang et al. 2015)

Where:

PT1 = Pretest one	PT2 = Pretest two	APT = Average of pretests
PoT1 = Posttest one	PoT2 = Posttest two	DPoT = Delayed posttest

*R1-CBI =	First round intervention after pretests
**R2-CBI =	Second round intervention after posttest one
PI =	Participant interview
x =	ten days' time interval between the two pretests
X =	Third round intervention (a two-month time interval after posttest two)

2.3 The Intervention: Experimental Work

In the current study, the following five specific phases were employed to ensure the effectiveness of the intervention procedure as stated below:

Phase I-Analyzing students' writing

At the very beginning of the intervention, a diagnostic test (two pretests) was given to the study participants. The raters adapted and used the IELTS Writing Task I assessment criteria for scoring and identification of major writing difficulties.

Phase II-Collection of models

After identifying the major challenges of the participants' writing, the researchers collected 200-model compare-and-contrast Band 9 essays from the IELTS Writing Task I website.

Phase III – Preparation phase

Step one: Preparation of self-compiled corpora and hands-off materials: To prepare the self-compiled corpora, the researchers adapted Anthony (2017) self-compiled corpus preparation guidelines. For academic writing instructional purposes, EFL teachers, researchers, and linguists can collect relevant written texts from published sources like books, websites, essays, newspapers, and online sources ..., and prepare need-based corpora (Anthony, 2017). After collecting model texts, they were coded and stored separately in a computer for further use (i.e., as a self-compiled corpus). Next, relevant tasks and activities were designed corresponding to the previously identified participants' writing difficulties.

Step two: Train the study participants on how they can exploit corpus data using AntConc software: According to Anthony (2017), utilizing AntConc software is not a difficult task for those who are familiar with basic computer skills. Hence, since Ethiopian secondary and tertiary curricula require students to take introductory computer courses, the researchers found that introducing AntConc to university students was straightforward.

Phase IV-Conducting the classroom intervention

For classroom intervention, the researchers used a total of 36 hours within four months from September to December 2024. For data exploitation, the participants used the AntConc software (version 4.0.11.0) tools, mainly concordance lines of the keyword in context (KWIC), collocates, and N-Grams without internet connections using computers, and model essay printouts manually. The Teaching Learning Cycle (TLC) guided the intervention classes through its five stages: building the context, modeling and deconstructing the text, joint construction, independent construction, and linking related texts similar to the target essay as indicated in Figure 4 below.

According to the research findings of Singer and Moscovici (2008), teaching and learning cycles in the

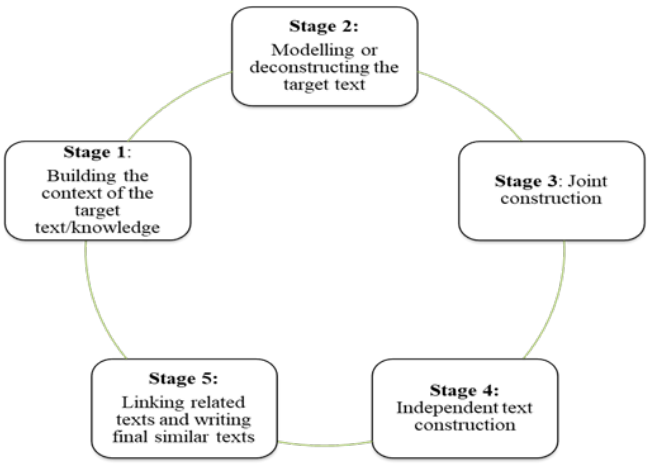

Figure 3: The Teaching and Learning Cycle used in the study intervention: modified from Singer and Moscovici (2008)

DDL approach enhances genre-based academic writing instruction. To explore target language for the target instruction, study participants used concordunce lines as shown below. From the concordance line, they investigate word patterns and search alternetive word or phrase use.

Phase V: Assessing intervention effects

After the provision of diagnostic tests, two tests (PoTI and PoTII) were administered to investigate the immediate effects of each intervention round within a one-month interval. At the end of each posttest, students' performance was recorded, and major writing difficulties were identified. Besides, a participant interview was conducted on the same day that the PoTII was provided. Then, to assess the relatively long-term intervention effects, a delayed posttest was administered after a two-month time interval from posttest two, which was considered the final activity of the actual classroom intervention.

3 DATA COLLECTION AND ANALYSIS

3.1 Data Collection Instruments

Data collection tools included writing tests, interviews, and a questionnaire. Two pretests were administered within a 10-day interval before the intervention to identify the participants' writing performance level, and common major writing difficulties in terms of the four quality text assessment criteria. Two posttests followed within a month interval, and a delayed posttest was provided two months later. Two raters evaluated each participant's performance using the British Council's IELTS Writing task I descriptors, scoring out of 100% with 25% shared to each criterion.

For this study, three participants were selected for interviews based on their initial performance: a low scorer (PI-1), a medium scorer (PI-2), and a high scorer (PI-3), with scores of 22, 32, and 44, respectively. Using diverse interview participants enhances data reliability and validity (Creswell, 2014). The questionnaire, consisting of 14 five-point Likert scale questions, assessed perceptions of the CBI intervention, focusing on text quality criteria, instructional materials, and teaching methods. Both the questionnaire and the participant interview used to collect data to assess the participants' perceptions.

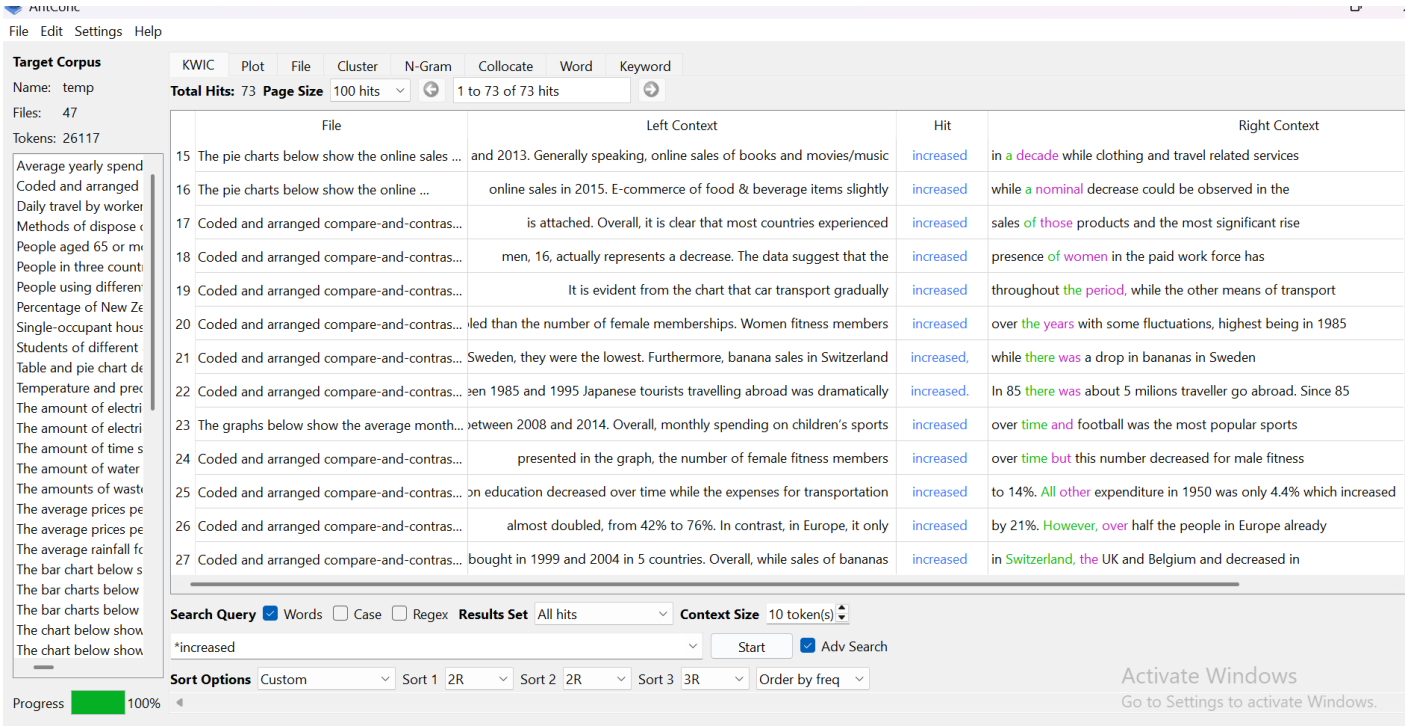

Figure 4: Sample concordance lines to learn the language uses of the word *increase in the KWIC AntConc Tool (Taken from the self-compiled corpora

3.2 Data Analysis Procedures

Data collection tools included writing tests, interviews and questionnaire. Five adapted tests were used to gather quantitative data on participants' writing achievements over time. Two pretests were administered within a 10-day interval before the intervention to identify the participants' writing performance level and common major writing difficulties in terms of the four quality text assessment criteria. Two posttests were also administered within a one-month interval, and a delayed posttest was provided two months later. Two raters evaluated each participant's performance at all tests.

Mixed method data analysis was employed with an explanatory sequential framework (quan-qual), beginning with quantitative data followed by qualitative analysis. Subedi (2016) notes this design aligns with a pragmatist worldview. The quantitative phase assessed participants' academic essay scores using two experienced raters, adapting the IELTS criteria. Statistical tools, including paired-samples t-tests and means, evaluated changes in writing development, while qualitative data from interviews were thematically analyzed to assess the major writing difficulties. Pre-evaluations confirmed content validity and test-retest reliability, yielding Cronbach's alpha values from .797 to .921, with overall test reliability confirmed at .923 before analysis. Participants had been given 1 and ½ hours to complete an essay of 200–250 words for each test.

Here is the LaTeX code to recreate the reliability statistics table from the image. I have used the booktabs style for a clean, professional appearance that matches the layout of the source.

Table 1: Reliability statistics on pairs of pre-tests and post-tests

Cronbach's Alpha	*N of Items
.923	5

Note: *N indicates the total number of tests given and marked by the two raters.

Similarly, interrater reliability was computed at the individual's text level, and it was found that its average was more than α >0.81 across all tests. Since the alpha value is greater than 0.7, it was considered that all tests were reliable and could be used as a data collection tool (Creswell, 2014). Additionally, the assumptions of normality and homogeneity were assessed before analyzing the statistical significance of the intervention with a paired samples t-test. Normality was evaluated using a Q-Q plot based on the average test scores from the participants' pretests, posttests, and delayed posttests, and the results indicated that the data followed a normal distribution. To assess the homogeneity of variances, Levene's Test was computed, yielding a p-value greater than 0.05, which indicates that the variances were equal..

4 RESULTS AND DISCUSSIONS

4.1 Results

The result of the current study is presented in light of the research objectives which we intended to address:

Research objective 1: To investigate how corpus-based instruction differentially impact students' writing development across four text quality criteria: grammatical range and accuracy, vocabulary, task achievement, and cohesion & coherence. In order to assess the impact of ten days' time interval between the two pretests, a paired samples t-test was computed as resulted in the Table 2 below.

Table 2: A paired samples t-test on the participants' pretests text quality

Text Type	Text Quality Assessment Criteria	Group	N	Mean	SD	T	df	Sig. (p-value)
Compare and contrast essays	Overall text quality	Average pretest I	50	6.9100	1.37559	1.230	49	0.225
		Average pretest II	50	6.825	1.55777			

As shown in Table 2, a paired samples t-test was conducted to assess the effects of the intervention on participants' writing development by comparing pretest and posttest scores. The analysis of the two pretests revealed no significant difference in writing performance, with a p-value of (t (49) = 1.230, p=.225). This indicates that the participants' performances were similar. In contrast, significant differences were observed between the total average pretest and posttest scores: posttest I and posttest II, and posttest II and the delayed posttest, with p-values of (t (49) = 25.061, p = .000), (t (49) = 21.073, p =.000), and (t (49) = 14.243, p=.000), respectively. These results suggest that the corpus-based instruction significantly enhanced the participants' academic writing performance. The mean difference between the average posttest I and the total average pretest was 5.23, indicating improvement due to the intervention. Besides, the paired samples t-test for all tests across the four text quality criteria was statistically significant at a p-value of 0.000 as shown in the Table 3 below.

To examine the impact of each of the intervention rounds on each writing sub-skill, a paired samples t-test was also conducted. Hence, as illustrated in Table 3, statistically significant differences were found in the improvement of participants' writing sub-skills after each of the intervention rounds, with a p-value of .000 for all writing sub-skills: grammar accuracy and range, vocabulary usage, text coherence and cohesion, and task achievements.

For grammar accuracy and range, the mean differences (MD) between average pretest and posttest I, average pretest and posttest II, and average pretest and delayed posttest scores increased as: average pretest and posttest I (MD = 2.62, SD = 0.692), average pretest and posttest II (MD = 3.61, SD = 0.692), average pretest and delayed posttest (MD = 4.36, SD = 0.684) all with a p-value of .000 implies the participants' use of grammar accuracy and range was improved due to the intervention. For vocabulary

Table 3: A paired samples Test based on the four quality text criteria

		Paired Differences						
					95% CI			
Pair	**Pairs of Tests**	**Mean**	**SD**	**SEM**	**Lower**	**Upper**	**t**	**Sig.**
1	Pre-Grammar - Post I Grammar	-2.61700	.69218	.09789	-2.81372	-2.42028	-26.734	.000
2	Pre-Grammar - Post II Grammar	-3.61700	.69218	.09789	-3.81372	-3.42028	-36.950	.000
3	Pre-Grammar - Delayed Grammar	-4.35700	.68451	.09680	-4.55153	-4.16247	-45.009	.000
4	Pre-Vocab - Post I Vocab	-2.19440	.88250	.12480	-2.44520	-1.94360	-17.583	.000
5	Pre-Vocab - Post II Vocab	-3.19440	.88250	.12480	-3.44520	-2.94360	-25.595	.000
6	Pre-Vocab - Delayed Vocab	-4.13440	.77141	.10909	-4.35363	-3.91517	-37.898	.000
7	Pre-Cohesion - Post I Cohesion	-2.25480	.46777	.06615	-2.38774	-2.12186	-34.085	.000
8	Pre-Cohesion - Post II Cohesion	-3.25480	.46777	.06615	-3.38774	-3.12186	-49.201	.000
9	Pre-Cohesion - Delayed Cohesion	-4.81480	.44796	.06335	-4.94211	-4.68749	-76.001	.000
10	Pre-Task - Post I Task	-1.29840	.74656	.10558	-1.51057	-1.08623	-12.298	.000
11	Pre-Task - Post II Task	-2.10240	.55542	.07855	-2.26025	-1.94455	-26.766	.000
12	Pre-Task - Delayed Task	-3.08240	.51431	.07273	-3.22856	-2.93624	-43.128	.000

usage, scores increased across the entire intervention rounds as: average pretest and posttest I (MD = 2.19, SD = 0.882), average pretest and posttest II (MD = 3.19, SD = 0.882), average pretest and delayed posttest (MD = 4.13, SD = 0.771) with a value of p = .000. This also indicates that participants showed significant improvement in their use of appropriate vocabulary in writing.

Regarding text coherence and cohesion, the mean differences showed a significant improvement at each intervention round as follows: average pretest and posttest I (MD = 2.25, SD = 0.468), average pretest and posttest II (MD = 3.25, SD = 0.468), average pretest and delayed posttest (MD = 4.81, SD = 0.446) with a p-value of .000. This suggests that participants' writing was benefited from the intervention in producing coherent and logically structured texts. Additionally, task achievement scores raised with mean a difference of between pairs of tests: average pretest and posttest I (MD = 1.29, SD = 0.746), average pretest and posttest II (MD = 2.10, SD = 0.555), average pretest and delayed posttest (MD = 3.08, SD = 0.514) with a p-value of .000. This also indicates that participants were more successful in writing texts that fulfilled the required criteria of the target essay. However, comparing to the other three text quality criterea, it was shown that the task achievment was relatively less benefited. Research objective 2: To examine the effect of corpus-based instruction on EFL learners with varying levels of writing performance in enhancing their academic writing skills.

One of the objectives of this study was to investigate how CBI differently impacts EFL learners' academic writing development regarding their initial performance levels. To evaluate the impact of the intervention, the total average pretest score was taken as a baseline achievement. Therefore, the participants' average mean difference between pretests and posttests were computed in line with their initial performance. For the analysis of this study, the two co-authors proposed the average benchmark mean scores for low, medium, and high achievers ranging from 1%-25%, 26%-50%, and 51%-100% respectively (see Table 4).

Table 4: Participants' test achievements average mean differences based on their initial writing performance

Total pretest point scale	**N**	**TAPT (100%)**	**PoT1 (100%)**	**PoT2 (100%)**	**APoT (100%)**	**Diff TAPT-PoT1**	**Diff PoT1-PoT2**	**Diff PoT2-DPoT**	**AMPoT**	**AMPoT-TAPT**
<25% (*low)	12.00	18.56	42.45	55.63	69.66	23.89	13.18	14.03	55.91	37.35
Avg >25%–<50% (*med)	31.00	28.55	49.32	53.22	71.33	20.77	3.90	18.11	57.96	29.41
>50% (*high)	7.00	51.33	61.23	66.55	70.67	9.90	5.32	4.12	66.15	14.82
Total	**50.00**	**32.81**	**51.00**	**58.47**	**70.55**	**18.19**	**7.47**	**12.09**	**60.01**	**27.19**

Regarding the participants' initial relative writing performance level, as indicated in Table 4, 12 par-

ticipants obtained a mean score of less than 25%, which was relatively the lowest achievement in the total pretest average. On the same tests, 31 participants scored more than an average of 28%, which was considered an average score for the medium achievers, and seven participants scored greater than 51%, which was a relatively higher initial test achievement. For the low, medium, and high achiever participants, the mean differences between their AMPoT and TAPT were 37.35, 29.41, and 14.82, respectively. However, the mean difference between posttest II and posttest I was 3.6, reflecting a slight decline in their writing performance. In contrast, the difference between posttest II and the delayed posttest showed a positive increment of 2.3. Similarly, the initial scores of three interview participants (22, 32, and 44) rose significantly to 66, 78, and 73 in their PoT2 assessments, demonstrating the effectiveness of the intervention, especially for low and medium achievers.

Research objective 3: To assess how students perceive learning to write through corpus-based instruction. To get an inclusive understanding of participants' perceptions of academic writing instruction through corpus-based methods, all interview questions, and questionnaire items were developed based on the four quality text criteria, as well as the instructional materials and methodologies associated with the intervention.

Table 5: Summary of participants' perceptions about the intervention

Items	Level of the Participants' Agreement in Percent (N=50)									
	Strongly disagree (1)		**Disagree (2)**		**Neutral (3)**		**Agree (4)**		**Strongly agree (5)**	
	No.	%	No.	%	No.	%	No.	%	No.	%
I acknowledge that CBI is essential to improving my grammatical knowledge.	0	0	0	0%	4	8%	4	8%	42	84%
I want to assure you CBI is essential to enhancing my vocabulary knowledge development.	0	0	0	0%	6	12%	4	8%	40	80%
I admit that the CBI is highly significant in improving text coherence and cohesion.	0	0	4	8%	5	10%	5	10%	36	72%
I have learned that the CBI is valuable to improve task achievements/requirements.	0	0	5	10%	5	10%	8	16%	32	64%
Average			**5**	**10%**	**5**	**10%**	**5**	**10%**	**37**	**75%**

As shown in Table 5 above, participants rated their agreement on how much the CBI aided their writing development concerning four text quality criteria. About 75% (N = 37) strongly agreed that the intervention was significant for their writing growth, while 10% (N = 5) also agreed on its importance for their essay writing. Overall, 85% (N = 42) of the 50 respondents viewed the intervention as crucial for their writing development. Conversely, 8% (N = 4) disagreed, and 10% (N = 5) were neutral regarding its impact on text coherence and cohesion. Similarly, 10% (N = 5) disagreed, and 8% (N = 5) were neutral about its effectiveness for achieving target essay tasks.

Interviews also supported these findings, with participants noting that the intervention positively influenced their writing. One interviewee (PI-1) stated,

> *"... corpus-based instruction is highly comfortable for learning grammar, vocabulary, and text coherence in academic writing. I improved my writing performance by obtaining model usages from the corpus." Another (PI-2) remarked, "This method is crucial for enhancing our grammar and vocabulary knowledge and creating coherent texts." However, interviewee (PI-3) mentioned challenges in extracting relevant information from concordance lines for grammar and vocabulary."*

The interviewees expressed their perception regarding the uses of the intervention respective to text quality criteria as follows: For me, this instruction was helpful for many things. Especially it is good for vocabulary and grammar learning (PI-2). ... It is important for grammar lessons and essay coherence and cohesion, in addition, it is nice for vocabulary education (PI-1)... according to my understanding, it is essential to learn grammar because the concordance line tells us grammar structures at once with a short time. The AntConc is more suitable for grammar and vocabulary learning (P-3).

This study used various materials, including self-compiled corpora and AntConc software, to assess participants' perceptions.

Table 6: Summary on participants' perceptions on the corpus-based instructional materials

Items	Level of the Participants' Agreement in Percent (N=50)									
	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly agree (5)	
	No.	%	No.	%	No.	%	No.	%	No.	%
I recognize that corpus data offers extensive real language input for learning academic essay writing.	0	0%	0	0%	0	0%	2	4%	48	96%
I became motivated by corpus data exploitation using AntConc tools and printouts.	0	0%	0	0%	0	0%	2	4%	48	96%
Using AntConc tools motivated me to explore corpus data, which provides diverse alternatives for language use and text structure.	0	0%	0	0%	0	0%	4	8%	46	92%
I believe that errors can be corrected through individual or group exploitation of corpus data.	0	0%	0	0%	0	0%	6	12%	44	88%
Computer-assisted CBI enhances EFL learners' exposure to updated authentic language sources.	0	0%	0	0%	0	0%	5	10%	45	90%
Average	**0**	**0%**	**0**	**0%**	**0**	**0%**	**4**	**8%**	**46**	**92%**

Results in Table 6 shows that 4 (8%) agreed and 46 (92%) strongly agreed the materials benefited their academic writing. Notably, 48 participants (96%) found the corpus data valuable, and 90% considered the resources updated and authentic.

While interviewees had varying performance levels in target writing before the intervention, all three reported positive benefits from the materials. Initially, participants expressed concerns about using AntConc and session duration. However, as the intervention progressed, they became more motivated and engaged. One participant remarked, "... as time goes on, everything becomes interesting and encourages better participation." Both PI-2 and PI-3 resounded this sentiment, feeling motivated to explore corpus data for patterns, correct errors, and embrace modern technology in their learning.

Since the interviewees had never used such kinds of instructional materials, they aspired that they would produce quality texts if they could have learned writing in their previous EFL classes. In this regard, PI-1 said, "... let alone my primary education, I suffered getting relevant and authentic teaching materials with better quality and quantity at secondary school and university levels. ... I think even our English teachers did not know this teaching method". Again, the PI-2 explained that this method can motivate the EFL learners and others to use modern technologies in a very simplified way saying "... this approach is very advanced in technology, simple, and helpful to learn writing".

4.2 Discussion

4.2.1 Effects of the intervention on the development of writing and the participants' perceptions

For this study, writing text quality refers to a total average of participants' test results of task achievement, grammatical accuracy and range, vocabulary usage, and text coherence and cohesion in each test given during the intervention and the post-intervention (i.e., the delayed posttest). Therefore, the statistical mean differences between the total average of the two pretests and the first posttest, the first posttest and the second posttest, the second posttest and the delayed posttest were highly significant at a value of ($t(49) = -25.061$, $p = .000$), ($t(49) = -21.073$, $p = .000$), and ($t(49) = -14.243$, $p = .000$) respectively which was over significant than the results of the pretests. This indicates that the intervention was effective and assisted the participants in developing their academic writing consistently. Moreover, the findings of this study revealed that the impact of the corpus-based instruction was reflected even after a two-month time interval since its completion.

Additionally, even though there are certain differences of effect size of the intervention, each of the

four text quality components was shown significant improvements. As a result, grammar accuracy and range, vocabulary usage, text coherence, and cohesion were benefited better than the task achievements. In this regard, several previous research findings support the results of the current study. Yaakob (2014) emphasized that CBI is essential for enhancing genre-based EFL writing skills through lexical bundles and meta-discourse. Moreover, the findings of researchers (Amare, 2022; Elsherbini & Ali, 2017; Flowerdew, 2010; Vyatkina, 2020; C. Yoon, 2011) confirmed corpus data as effective input for developing vocabulary and grammar across writing genres support the results of this study. In line with the findings of this study, to address the EFL learning challenges in higher education, concepts of Activity Theory: a socially constructed, goal-oriented, and technology-assisted language learning environment study is important (Isssroff & Scanlon, 2002).

Another result of this study indicates that low and medium achievers showed better improvement than high achievers, and this is consistent with H. Yoon and Hirvela (2004), which found that intermediate learners benefited more than advanced learners.

Analysis of the questionnaire and semi-structured interview responses also indicated that participants had a positive perception through out the intervention. However, they expressed varying levels of agreement regarding the significance of corpus data related to the four quality text criteria. The questionnaire results showed the intervention's effectiveness in developing essential writing features, with importance ratings for grammar (92%), vocabulary (88%), coherence and cohesion (82%), and task achievement (80%). This finding also aligns with previous research (Amare, 2022; Elsherbini & Ali, 2017; H. Yoon & Hirvela, 2004). While participants viewed the intervention positively for learning academic writing features, they primarily focused on using the corpus to enhance grammar and vocabulary knowledge. Similarly, the participant interview responses revealed that the present study participants had a strong interest in using corpus data to learn these aspects of academic writing. Participants were particularly impressed by AntConc features, such as keyword in context, N-gram, and collocates, which helped them explore alternative grammar and vocabulary usage for improved writing performance. For the improvment of the participants' text coherence and cohesion, searching various uses of cohesive devices (i.e., transitional signals) from the self-compiled corpora using the AntConc software played a great role. Furthermore, Elsherbini and Ali (2017) highlighted CBI's significance for grammar and vocabulary development in writing, enhancing learners' perceptions of corpus-based instruction (Szudarski, 2023).

Similarly, the intervention received positive feedback from both interviewees and questionnaire respondents about their writing experiences, highlighting three key themes: text assessment criteria, instructional materials, and teaching methodologies, along with motivation for learning. Notably, 92% of participants agreed that the materials supported diverse language uses, and 88% felt they aided in error correction. Additionally, 90% of them noted the integration of new technologies is important. Furthermore, interviewees emphasized that instructional materials and methods used increased their interest in essay writing. Overall, participants found CBI beneficial for independent and collaborative learning, supporting earlier findings on the effectiveness of corpus-based instruction which is supported by the principles of Activity Theory. According to Activity Theory, productive interactions between learners and instructional materials in a constructivist and technology-enhanced environment can lead to improved learning outcomes (Engeström, 2009).

5 CONCLUSIONS AND RECOMMENDATION

5.1 Conclusions

The present study investigated the effect of corpus-based instruction on the academic writing development of target EFL learners, as well as their perceptions of using the corpus (specifically, IELTS Writing Task 1 questions and responses) concerning their initial writing performance levels. The findings indicate that while corpus-based instruction significantly benefited learners across all performance levels, those with relatively low and medium test scores experienced greater improvements compared to high

achievers. The study participants expressed positive perceptions on learning academic writing using corpora, appreciating its moderate approach, flexibility, and extensive range of instructional materials and methodologies that curriculum developers, text writers, and EFL teachers shall consider.

5.2 Recommendation

The sample size of 50 third-year software engineering students is insufficient to represent the broader population. Again, the absence of a control group restricts comparisons between CBI and traditional methods. So, we recommend that future researchers conduct longitudinal studies with larger sample sizes for better understanding across different gener types.

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CONFLICTS OF INTEREST

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