




Digital Feedback in a Crisis Period: A Study of Electronic Corrective Feedback on Ghanaian Students' Business Letters During the COVID-19

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Abstract

This study examined the efficacy of electronic corrective feedback (ECF) on the business letters of selected Ghanaian technical university students. A sequential exploratory mixed-methods design was used for this study. Thus, the study employed both qualitative and quantitative data. Consequently, 80 scripts from 40 students (i.e., 40 pre-test and 40 post-test scripts), and 20 questionnaire items from the same students were used. At the pre-test level, the participants composed one business letter each. Afterwards, the ECF intervention was applied to the pre-test items. Then, they were asked to write another letter at the post-test level. After the pre- and post-test activities were conducted, the participants filled out questionnaires. Therefore, the sample size (in terms of raw data) was 120. The research, thus, investigated the types of ECF provided by teachers on students' scripts, students' perceptions of ECF, and its impact on their writing skills. Findings indicate that teachers primarily used MS Word's track change feature to provide direct ECF, focusing on vocabulary, spelling, concord, punctuation, syntactic, and semantic errors. Students generally perceived this ECF as beneficial, reporting improved awareness of writing errors and enhanced writing skills. However, challenges such as limited Internet access, delayed feedback, electricity fluctuations, and difficulties in reviewing the pre-test items were noted. The study recommends that educators adapt feedback strategies to suit online learning environments better, incorporating multimedia feedback and regular virtual check-ins to enhance student engagement and understanding. The findings contribute to the growing body of research on technology-enhanced learning and feedback, offering insights into the potential of ECF to support student writing development in Ghana and at technical universities.

Keywords: Electronic Corrective Feedback, COVID-19, Online Learning, Ghanaian Students, Business Letters, Digital Literacy, Pre-and Post-Test Items

Background to the Study

Most second language learners commit several errors in their business communication texts (Owusu, 2021a). The situation in the Ghanaian higher education institution (HEI) context is not different. Thus, the importance of writing skills in academic success cannot be overstated. Writing is a basic skill that students master to succeed in their academic pursuits and future careers (Hyland & Hyland, 2006). However, teaching writing skills can be a challenging task, especially in a second language context. Differences between native languages and the international language (i.e., the English language) are some difficulties that Ghanaian second-language learners face when it comes to writing. Sometimes, crises and other unforeseen issues may lead to the physical absence of the teacher from the classroom. This can also be a big challenge, especially when it becomes necessary for the teacher to offer face-to-face corrective feedback.

For example, the COVID-19 pandemic triggered unprecedented challenges to the educational sector globally. Like many other countries, Ghana closed all schools, and online learning became the norm. The prolonged pandemic was so severe that there was a rapid shift from traditional face-to-face instruction to online teaching, learning, and assessment. Since most higher education institutions (HEIs) in Ghana lacked a comprehensive policy on online teaching and learning, the transition exposed them. This situation presented some opportunities and challenges for teaching and learning, particularly in the area of writing instruction. Since teaching and learning were activities largely executed online, electronic corrective feedback (ECF) was an indispensable tool that language teachers used to provide feedback on students' texts. This is to say that written corrective feedback (WCF), a crucial aspect of grading (according to Beuningen, 2010; Bitchener, 2008; and Ferris, 1999), was adapted electronically for assessment during this era.

Despite the growing body of research on WCF and ECF, there is limited understanding of how ECF was used in HEIs in Ghana, particularly during the COVID-19 pandemic. The challenges that warranted research in this area are many. When face-to-face teaching and learning activities were banned during the COVID-19 pandemic, most students complained about a plethora of challenges they faced in their quest to conduct online learning and assessments. Though some were attributed to a lack of logistics, it is widely believed that many students were not comfortable with this virtual phenomenon. This study, therefore, aims to contribute to the growing technology research in virtually all fields of study. The rationale is that the insight gained will serve as a blueprint for institutions and other stakeholders regarding language assessment using the virtual mode. This may comprehensively develop Ghanaian and African students' language in the 4th industrial revolution era. On that basis, the objectives of the paper are to:

1. determine the function of ECF in students' business letters throughout the

COVID-19 pandemic,

2. assess the influence of ECF on the Ghanaian students' written communication during the pandemic, and
3. examine the strength of pre-and post-test items for assessing students' letters during any form of educational disruption.

Literature Review COVID-19 and E-Learning

Digitalisation has gained prominence among business and educational entities in the 21st century (Owusu et al., 2023). According to Dhawan (2020), this digitalisation process has expanded from the onset of the COVID-19 pandemic to date, leading to a shift in the traditional mode of teaching and assessing students. According to a study by Aristovnik et al. (2020), the pandemic has accelerated the adoption of e-learning, with many institutions embracing digital technologies to facilitate learning. For instance, in Ghana, educators were forced to adapt to online learning environments.

As some stakeholders of HEIs have embraced the digital technology phenomenon, others are worried about its many challenges. For example, in Owusu (2023), when the participants were asked about their general view about virtual teaching and learning (VTL), the majority of them indicated that it was time for all language teachers and learners to realise that VTL had come to stay and that measures should be taken to ensure that its full operationalisation in the technical university context is faced with fewer challenges. Thus, the pandemic's impact has continued to fuel debates, as it triggered rapid and massive changes in highly institutionalised elements of our collective lives by fast-tracking trends that were already underway (Hwang and Höllerer, 2020).

Written Corrective Feedback

In second language acquisition (SLA) and writing instruction, written corrective feedback (WCF) is a widely used pedagogical tool that has been used for grading students' texts over the years. In language study, the aim of corrective feedback, especially written corrective feedback, is to facilitate the writing of language learners by providing reformative input to students' faulty structures. This notwithstanding, the efficacy of corrective feedback has been a topical issue after Truscott (1996) published his paper on the negative side of corrective feedback. Subsequently, corrective feedback has gained prominence in language teaching, learning, and assessment. Corrective feedback is grounded in several theories. Some of them are Long's (1996) Interaction Hypothesis, Swain's (1985) Output Hypothesis, and Krashen's (1985) Input Hypothesis. All these theories have mentioned the efficacious role that corrective feedback plays, especially in error correction.

According to Bitchener and Ferris (2012), since written corrective feedback (WCF) provides learners with direct feedback in their language studies, it is an effective tool for promoting language development. There is empirical evidence that links second language learners' proficiency to WCF. For example, some studies suggest that while indirect feedback can be used for learners with high proficiency levels, direct feedback is for learners with low proficiency levels (Bitchener, 2008; Owusu, 2017; Owusu, 2019; Owusu, 2020a). Similarly, Ferris (1999) has argued that corrective feedback should not be used for all errors, but for specific error types. However, for WCF to be effective, it is dependent on factors such as the type, the proficiency level of the learners, and the frequency. In the literature, different WCFs abound. For example, direct feedback provides learners with explicit corrections, while the indirect feedback technique is used to announce the existence of errors in a write-up without correcting those errors (Owusu, 2017; Owusu, 2019; Owusu, 2020a).

Studies (for example, Chandler, 2003; Ferris & Roberts, 2001) have shown that both direct and indirect feedback can be effective in improving learners' writing accuracy. However, during the COVID-19 era, when most countries placed a ban on traditional face-to-face teaching and learning, teachers found it problematic to use some types of WCF. This warranted the compulsory use of electronic corrective feedback (ECF).

Electronic/Digital Corrective Feedback

In recent years, electronic corrective feedback (ECF) has gained significant attention, particularly in the context of e-learning in most higher education institutions (HEIs). According to Ellis (2008, p. 98), in electronic feedback, the teacher indicates an error and provides a hyperlink to a concordance file that provides examples to correct usage. Thus, electronic corrective feedback (ECF) is a type of corrective feedback provided by a machine, using digital tools and platforms (Lamy & Hampel, 2007). ECF refers to computer-facilitated feedback delivered electronically by teachers with the assistance of a computer. It is common for students to submit their assignments and complete tests through online platforms, and they receive electronic feedback from the instructor, such as comments on their Word document or a detailed email with error repairs (Bruce, 2017; Ene & Upton, 2018).

Among the ECFs that teachers can use on students' online texts are using the Word document's track change feature, Google document comments, annotation tools, audio or video feedback, rubrics and grading tool, and peer review tools. However, audio and video feedback may not only be ECF, but oral electronic corrective feedback (OECF).

Research has shown that ECF can be an effective tool in improving students' writing skills, particularly in online learning environments (Ware & Warschauer, 2006). Nipaspong (2022) conducted a study about how teachers' online written corrective feedback (WCF) impacted university students' self-regulation in writing. The results from

pre- and post-questionnaires and interviews revealed the positive effects of teachers' online WCF on students' self-regulation in writing. The results from this study indicated the effectiveness of online WCF in developing L2 learners' self-regulation. The results also provided insight into how language ability levels affect learners' online feedback attitude and its impact on self-regulated learning development. Also, a study by Elola and Oskoz (2011) found that ECF can provide students with immediate feedback on their writing, helping them to identify and correct errors. However, the effectiveness of ECF depends on several factors, including the type of e-feedback provided, its quality, and the student's ability to utilize digital tools. Several scholars (for example, Al-Olimat et al., 2015, and Yamashita, 2021) have argued that ECF could be an effective tool to facilitate learning and improve students' writing performance, as students who received ECF from their teachers and peers significantly outperformed participants in other conditions in most writing aspects related to punctuation, grammar, and spelling.

However, the use of ECF has several challenges. In a study conducted by Gillis & Krull (2020), it was found that instructors were required to deal with some technology problems in their quest to use ECF. For example, lack of consistent internet, slow performance on the learning Moodle because of high-volume user traffic, and the capacity of the device students used at home influenced the speed and quality used in accessing the online course, video instructions, or other learning materials (Gillis & Krull, 2020). Additionally, Owusu (2017) reported that ECF can only work in an environment where both the teacher and the learner are computer literate and have access to computers. Two, for this ECF to work effectively, there should be continuous and effective access to the Internet since the teacher may have to provide a hyperlink to an Internet source that provides information about the error. Three, in an environment like Ghana, where there is frequent power outage, this type of CF might not be successful in terms of providing speedy corrections. Lastly, providing ECF on the soft copies of scripts of many students could be a Herculean task (Owusu, 2017).

In sum, a systematic review of cutting-edge research on ECF in university contexts reveals that, while there is limited awareness of digital corrective feedback among tutors, existing studies show promising results (Chong, 2019).

Empirical Review Studies on Electronic Corrective Feedback and Students' Writing Skills

Generally, there are studies on ECF and students' writing skills. For example, Shadiev et al. (2019) examined the success of computer-assisted language learning (CALL) and students' listening and speaking skills using 64 respondents, and realized that the experimental group (i.e., the CALL group) demonstrated massive improvement. In another study, Li and Hegelheimer (2013) found that ECF was strong in treating grammatical flaws in students' texts. Xu and Li (2018) used CALL on Chinese EFL learners' vocabulary

learning process and perceived that the CALL intervention aided the participants' vocabulary acquisition process.

In another development, Liu and Sadler (2019) investigated students' online learning engagement and found that ECF was potent in dealing with errors remotely, but has technical challenges of difficulties in understanding some digital procedures. Lastly, Chen et al. (2022) did a study on virtual reality on language learning and found that virtual-assisted language learning has a medium effect on language gains. Thus, the evidence from the empirical studies manifests that ECF plays a major role in language learning and development.

Methods

This study employed a sequential exploratory mixed-methods design, combining both quantitative and qualitative data to assess the effectiveness of electronic corrective feedback (ECF) on Ghanaian students' pre-and post-test letters during the COVID-19 pandemic. The mixed-methods design allowed for a comprehensive understanding of the research problem, providing both numerical data and rich, contextual insights (Creswell & Plano Clark, 2017). Sequential exploratory design involved two phases, where the researcher first collects and analyses qualitative data, followed by quantitative data collection and analysis (Creswell and Plano Clark, 2017). The Likert Scales variables of 'strongly disagree, disagree, neutral, agree, and strongly agree' were used to solicit the participants' perception about ECF.

The population for this study consisted of technical universities (TUs) in Ghana. Specifically, the study focused on first-year Computer Science students in a selected TU. The sample size consisted of 120 raw data collected from the 40 sampled participants at the pre- and post-test levels. A combination of simple random and purposive sampling techniques was used to select the participants. Purposive sampling was used for the target technical university and first-year students in the Computer Science Department at that university. After this, a simple random sampling technique was used to select 40 participants.

The study employed two data collection instruments – questionnaire items and pre- and post-test online mid-semester examination scripts. Forty (40) pre-test items and 40 post-test online mid-semester business letters of these selected participants were used. After the post-test assessment, a questionnaire was administered to the 40 participants to gather data on their opinions about the use of electronic corrective feedback (ECF) on their online business letters during the COVID-19 era. So, in all, 120 raw data were collected. On data analysis, an analytical framework was used to examine the pre- and post-test business letters, while the questionnaire items were analysed using IBM SPSS version 25.

Results and Discussion

The results and discussion of the study were not done haphazardly. The analyses, results, and discussion are based on the design selected for the study, the objectives, the results from the SPSS, and the analytical framework used in grading the texts.

The framework adopted for assessing the business letters of the participants was the Business Letter Analytical Framework (BLAF), propounded by Owusu (2022). BLAF has four independent variables: layout, rubrics, language and formatting, and grading (see Figure 1). In using BLAF, the assessor must follow the tenets 1 to 4 religiously. Under each of the study's objectives, the qualitative data are first analysed before the quantitative data; this is in line with a sequential exploratory mixed-methods design (Creswell and Plano Clark, 2017).

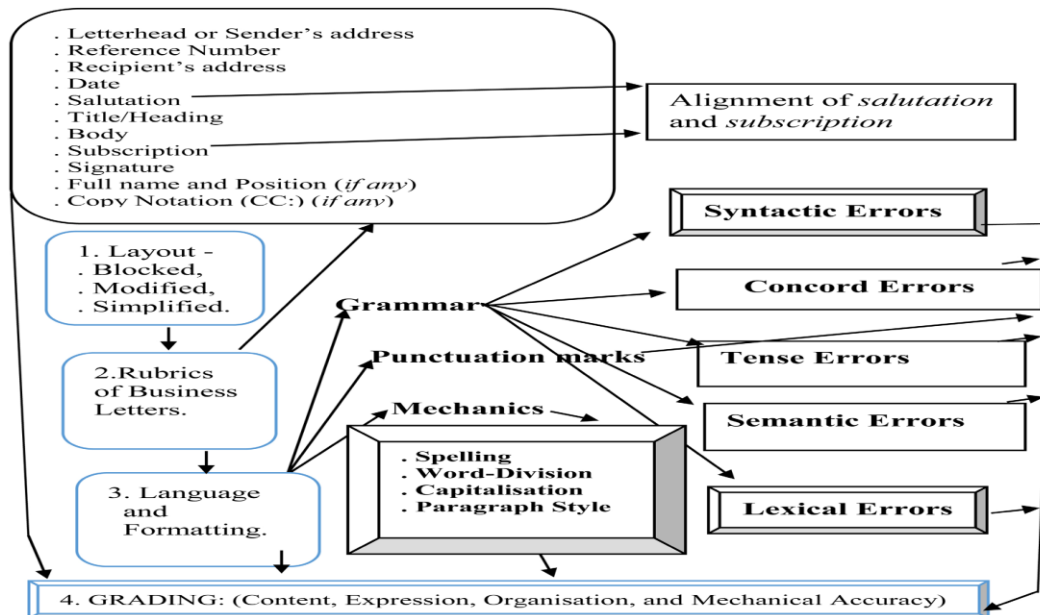


Figure 1: Business Letter Analytical Framework (BLAF)

Source: Owusu (2022)

The Impact of ECF on Ghanaian Students' Writing Skills during the COVID-19 Pandemic

The study revealed that ECF has a positive impact on students' writing skills. After the 40 participants had developed pre-test business letters, their scripts were track-changed electronically using BLAF (see Figure 1) as the scheme. They were then asked to compose post-test scripts by effecting changes to the portions that the assessor pointed out.

Table 1: Pre- and post-test vocabulary, spelling, concord, and punctuation errors of the participants

SENTENTIAL	NUMBER OF PRE- AND POST-TEST ERRORS COMMITTED		COMMENTS
	PRE-TEST ERRORS	POST-TEST ERRORS	
Vocabulary	198	89	109 vocabulary errors were corrected.
Spelling	248	37	211 spelling errors were corrected.
Concord	210	78	132 concord errors were corrected.
Punctuation	223	37	186 punctuation errors were corrected.

Source: Field data, 2020

The results of the data in Table 1 show that at the pre-test level, the participants committed 198 vocabulary errors; however, at the post-test level, only 89 were recorded. Thus, the ECF intervention was able to correct 109 vocabulary errors. Again, while 248 spelling errors were found and corrected at the pre-test level, only 37 errors were seen and corrected at the post-test level; this means that ECF intervention was able to correct a total of 211 errors at the post-test level. In the case of concord, a total of 210 pre-test errors were seen and corrected at the pre-test level; however, when ECF intervention was applied to their scripts, only 78 errors were seen and corrected at the post-test level. For punctuation errors, 223 were seen and corrected at the pre-test stage. However, when the ECF intervention was applied to their scripts, only 37 were seen and corrected. So, the application of the ECF was able to treat as many as 186 punctuation errors at the post-test level.

After the post-test assessment, the participants were asked (in the questionnaire) about their impression of the application of the ECF to their scripts. Thirty-five (35) out of the 40 participants indicated that the application of the ECF intervention at the pre-test level had a positive impact on the business letters that they wrote at the post-test level, especially when a ban had been placed on face-to-face teaching and learning. This revelation aligns with Nipaspong's (2022) study, which showed the effectiveness of online WCF in developing L2 learners' self-regulation.

However, the current study revealed that ECF has some challenges in treating syntactic and semantic errors effectively. Thus, while ECF (through pre- and post-test interventions) was strong in treating spelling, punctuation, vocabulary, and concord errors, it (ECF) was weak in treating errors of ambiguity, dangling modifiers, word order, incoherent phrases, semantic inconsistency, pronouns, and idiomatic. Thus, from Table 2, it is clear that at the pre-test level, a total of 135 syntactic errors were seen and corrected, and at the post-test level, the participants committed 98 syntactic errors again. This means that ECF was able to correct only 37 syntactic errors. Similarly, at the pre-test level, the participants committed 141 semantic errors, and at the post-test stage, 100 of the same error type were seen and corrected again. This shows that ECF was able to correct only 41 semantic errors in the participants' business letters at the post-test stage.

When the participants were asked (during the questionnaire filling section) whether ECF is potent in correcting errors of ambiguity, dangling modifiers, and wrong word order, 30 of them answered in the negative. Most of them cited a misunderstanding of the assessor's instruction, difficulties in reviewing the semantic issues at the pre-test level, and a lack of clarity in the error codes provided by the assessor as some of the difficulties they encountered in their bid to revise the syntactic and semantic errors. These challenges align with the findings of Li et al. (2014), who observed that the lack of contextual understanding in the use of the ECF tool may force learners and users to struggle in understanding context, which will eventually lead to inaccurate feedback. A study by Grimes and Warschauer (2010) also suggested that ECF tools often focus on surface-level errors, overlooking more significant issues. Thus, ECF has a challenge of addressing higher-order concerns.

Table 2: Pre- and post-test syntactic and semantic errors of the participants

SENTENTIAL	NUMBER OF PRE- AND POST-TEST ERRORS COMMITTED		COMMENTS
	PRE-TEST ERRORS	POST-TEST ERRORS	
Syntactic	135	98	Only 37 syntactic errors were corrected.
Semantic	141	100	Only 41 semantic errors were corrected.

Source: Field data, 2020

The Role of Electronic Corrective Feedback (ECF) on the Scripts of Students during the COVID-19 Pandemic

In 2020, when the government prohibited face-to-face teaching and learning, most educational institutions had to resort to virtual teaching, learning, and assessment. This objective sought to solicit the opinions of the participants regarding the role that ECF played in modifying their mid-semester scripts during the COVID-19 pandemic lockdown. So, the Likert Scale variables of strongly disagree, disagree, neutral, agree, and strongly agree were used to solicit the participants' views about the statement: '*Online assessment using track change plays a positive role in my scripts by improving my writing accuracy and language development.*' From Table 3, twenty-five (25) (i.e., 62.5%) participants selected '*agree*', 8 (i.e., 20%) selected '*strongly agree*', 5 (i.e., 12.5%) selected '*neutral*', 2 (i.e., 5%) selected '*disagree*', and no one selected '*strongly disagree*'. Having 33 (i.e., 82.5%) of the 40 participants answering in the affirmative is an indication of the positive role that ECF plays in writing accuracy and language development. Thus, the respondents realized that ECF was not just a virtual stopgap for assessing their scripts during the COVID-19 pandemic lockdown, but a 21st-century tool that has the potential to deal with sentential errors positively. This aligns with numerous studies (for example, Al-Olimat et al., 2015; Yamashita, 2021) that have argued that ECF could be an effective intervention to facilitate learning and improve students' writing performance.

However, the minority of the participants (i.e., 17.5%) thought otherwise. They (i.e., the minority) cited poor Internet connectivity, lack of access to the Internet in their community, lack of data allocation, frequent power fluctuations, lack of PC/smartphones, and a lack of basic computer knowledge as some of the challenges. This result confirms the findings in Gillis & Krull (2020) and Owusu (2017). Additionally, Warschauer and Ware (2006) have highlighted the potential risks of overreliance on automated feedback tools as a big issue. Attali and Burstein (2006) have also discussed the potential for ECF tools to provide incorrect feedback.

Table 3: The Role of ECF on the scripts of students

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL
Option/ Answer	-	2	5	25	8	40
Percentage	-	5%	12.5%	62.5%	20%	100%
Scale	1	2	3	4	5	

Source: Field data, 2020

The Use of Pre- and Post-Test Items in Grading Students' Texts during any Form of Educational Disruption

Although the main intervention used in this current study was the electronic corrective feedback (ECF) tool, the use of both pre- and post-test items might have played a massive role in the efficacy of ECF. Therefore, the third objective sought to elicit information about its uses during the COVID-19 pandemic lockdown. From Tables 1 and 2, it is obvious that there are disparities in the errors found and corrected at the pre- and post-test stages. For example, in Table 1, one hundred and ninety-eight (198) vocabulary errors were seen and corrected at the pre-test level. However, at the post-test level, these errors were reduced to only 89. This means that the use of both pre- and post-test items enabled the participants to improve their language development and writing accuracy. Thus, when second language learners are given the second or even the third opportunity in their assessments, they may improve their language skills by developing native-like competence. In Owusu (2017), a recommendation was made for language teachers to incorporate pre- and post-test strategies into their teaching and learning assessments. Also, Newall et al. (2016) stressed the importance of collecting pre- and post-intervention practice data when conducting a randomised controlled trial. After the pre- and post-test item exercises were completed, participants were asked, during the questionnaire section, to indicate whether they would like a second chance to submit an assessment. Surprisingly, all 40 participants answered in the affirmative. This shows their preference for post-test assessments conducted by their teachers. However, in a situation where the student-teacher ratio is poor, the language teacher or the assessor will have a Herculean task conducting both pre- and post-test assessments for large classes, especially when the assessments are essay-based.

Conclusion

This study has demonstrated the effectiveness of electronic corrective feedback (ECF) on Ghanaian students' business letters during the COVID-19 pandemic. The study provides insights into the potential of ECF to support student writing development in Ghana and similar contexts during a crisis. The study's results show that ECF can be an effective tool in improving students' writing skills, particularly in terms of grammatical accuracy. That is to say that in areas like spelling, vocabulary, punctuation, and concord, ECF proved to be a strong tool. The use of MS Word's track change feature in providing direct ECF was found to be beneficial, and students generally perceived it as helpful in improving their writing skills. However, the study also highlights the challenges of implementing ECF in a resource-constrained environment, where limited internet access, fluctuating electricity, access to electrical gadgets (i.e., PC and smartphones), and delayed

feedback can hinder the effectiveness of ECF.

The findings of this study have implications for teaching practices, teacher training, and infrastructure development in the post-pandemic educational landscape. Therefore, language teachers should be trained to provide effective ECF, incorporating multimedia feedback and regular virtual check-ins to enhance student engagement and understanding. Additionally, infrastructure development should prioritise internet access and digital literacy to support the effective and holistic implementation of ECF.

In conclusion, this study contributes to the growing body of research on technology-enhanced learning and feedback, offering insights into the potential of ECF to support student writing development in Ghana and other jurisdictions. The findings of this study can inform the development of effective feedback strategies in online learning environments, ultimately enhancing student learning outcomes. By leveraging the potential of ECF, educators can provide students with the support they (i.e., students) need to succeed in their academic pursuits, even in the face of challenges posed by pandemics, industrial actions, tribal wars, floods, tsunamis, fire, and other natural and unnatural occurrences. However, further research is needed to explore the optimal sequencing of feedback and the long-term impact of ECF on student writing development.

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