The Effect of Internet-Based Applications on Written Communication Skills

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Abstract Despite its theoretical importance, there is a scarcity of experimental research into the effectiveness of internet-based applications in the English classroom context. The present study, using a mixed-methods design, aimed at examining whether online applications, including Adobe Connect and BigBlueButton, could improve writing. In doing so, a pool of 34 pre-intermediate students participated in the study based on convenience sampling, and a pool of six students participated in the qualitative phase of the study based on purposive sampling. IELTS task 2 band descriptor and semi-structured interviews were used to gather the data. One-way ANCOVA, theme-based categorization, and inter-coder reliability were conducted to analyze the data. The results confirmed that there was a statistically significant difference between the two experimental groups; the Adobe Connect group showed higher scores than the BigBlueButton group with respect to written communication skills. Following inter-coder reliability, ten common themes were elicited from the interviews, including innovative, fruitful in learning collocations, challenging, useful for distance learning, colorful, and bad internet connection. Ultimately, practical implications were provided for students and teachers.

Keywords: Internet-based applications, Adobe Connect, BigBlueButton, Written communication skills, EFL learners

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1. Introduction

In recent times, there has been a notable increase in academic focus on integrating technology into the field of second language teaching and learning (Lin et al., 2016; Ulla et al., 2020). Douglas (2010) highlights the value of technology and multimedia tools in L2 communication contexts. Warschauer (2004) states that there has been a transition in educational methods, moving away from traditional text-based resources towards the integration of computer-based materials that provide enhanced interactive learning opportunities. Students are increasingly drawn to using technology in their educational pursuits, including tools such as the Internet and email. Computer-aided materials are considered as tangible representations of Computer-assisted Language Learning (hereafter called CALL). Levy (1997) characterizes CALL as the study and assessment of computer software in the

field of language instruction. Fotos and Browne (2004) argue that one of the most important types of activity in CALL is writing skills.

Writing serves various purposes in communication, encompassing the creation of academic essays, business reports, letters, newspaper or web page analyses of current events, as well as the composition of emails and short offline messages through commonly utilized messenger programs (Persky et al., 2003). Naghdipour (2016) emphasized the importance of having strong written communication skills in English. Kanakri (2016) stated that students must acquire expertise in both linguistic and rhetorical structures of writing to enhance their writing proficiency. Moreover, EFL students should develop their written communication skills with respect to complexity, accuracy, and fluency (Ebrahimi et al., 2022; Modarresi, 2021). Hence, proficiency in expressive and effective writing enables individuals of diverse cultural, socioeconomic, and psychological backgrounds to convey their thoughts and articulate their requirements effectively (Al Abdwani, 2024; Pishghadam et al., 2022).

Pennington (2004) declares that much research concerning the relationship between CALL and L2 writing focuses on email and learning via the Internet. Online learning is a significant strand of research in the area of second language learning since, according to Park and Son (2009), learners can manage their learning process within a technology-enhanced setting by actively participating in gathering information and negotiating meaning. According to Modarresi and Alavi (2014), computers can serve as scaffolding tools, offering learners mediation by providing hints, prompts, and leading questions, and Lam and Lawrence (2002) suggest that the incorporation of computers in a communicative classroom leads to a shift from a traditional teacher-focused classroom to a student-centered classroom. Given the significant proportion of EFL learners who exhibit deficiencies in their writing abilities, the current study underscores the potential contribution of technology in enhancing communication skills, thereby promoting their writing development.

Computer-aided tools can assist teachers in facilitating the language learning process in English classes within our country. They have the potential to serve as a means of consolidating and reinforcing the knowledge acquired within the confines of the classroom. Douglas (2010) underscored the usefulness of online teaching in L2 communicative situations. However, researchers in the field of CALL are focused on creating a unified research agenda (e.g., Levy, 1997; Salaberry, 1999). The absence of a well-defined theoretical framework is impeding the progress of CALL, prompting professionals in this area to assess past work (Cameron, 1999) in order to establish effective methodological strategies. More specifically, research on computer-aided materials, particularly online learning, is still not sufficient in the Iranian context (Esfijani, 2018). Asian graduate students find academic writing really challenging (Al Fadda, 2012), but there is a deficiency in providing technological resources within the classroom setting. To tackle these problems, the current study aims to examine the effectiveness of two popular Internet-based applications, including Adobe Connect and BigBlueButton, which are available and user-friendly, with respect to written communication skills.

2. Theoretical Framework

2.1. Internet-Based Application and Second Language Acquisition

According to Delcloque (2000), the origin of CALL can be traced back to the 1960s, along with the increasing emergence of personal computers that led to the development of CALL programs and several publications in the late 1970s. CALL plays a significant role in distance learning, with many college professors in the United States, United Kingdom, and Europe incorporating online teaching into their courses (Fotos & Browne, 2004). Qashoa (2013) highlighted in his research that the increasing utilization of technology, along with Internet-based learning and teaching, has brought about a significant transformation in traditional language classrooms and, consequently, in language syllabi. While a wide array of technologies can aid in teaching, this overview will focus on technologies related to computer and Internet usage for the purpose of foreign language instruction and learning (Modarresi & Jalilzadeh, 2020). Mohammadzadeh and Rahimpour (2024) examined the effect of BigBlueButton vs. Skype on communication anxiety and oral communication skills and found a significant difference between the two groups. Just recently, Gholami and Abdwani (2024) found that artificial intelligence technologies improve efficiency and new modalities of expression in communication.

Aydin (2007) concluded that the Internet serves as a motivation for learners to use English in their daily lives, offering them functional and communicative experiences. In their pioneering work, Steel and Levy (2013) examined the usage of 20 different technologies by 587 students inside and outside language classes and concluded that in terms of both in-class and out-of-class usage, online dictionaries and web-based translators were found to be the most commonly used tools, with over 80% of students utilizing them and outside of class, YouTube (69%), social networking sites (57%), and mobile phone applications (56%) were frequently used for language study. Moreover, tools such as Skype, discussion forums, instant messaging, podcasts, blogs, and wikis were used by 30% to 49% of students to study languages outside of the classroom. Abbasian and Modarresi (2023) focused on the usefulness of online applications with respect to oral communication skills and found that Adobe Connect, as an online teaching tool, was conducive to language development.

2.2. Written Communication Skills and Computer-Based Tools in Second Language Acquisition

Computer-aided tools are among the new frequently-used trends in language classrooms, particularly in writing classes (Ginting & Fithriani, 2022). The current literature shows that CALL encompasses various types of software with respect to written communication skills (Fang, 2010). Pennington (2004) stated that a significant amount of research has been conducted on the correlation between CALL and L2 writing, with a particular emphasis on specific technologies such as word processors for composing and revising text, spell checkers and grammar checkers for correcting text, and email and the Internet for sending text electronically. Jafarian et al. (2012) discussed how computer-assisted writing instruction offers an alternative approach to traditional methods. This approach aims to address some of the limitations of traditional writing methods by providing feedback on students' mistakes and errors, as well as offering explanations and suggestions.

The existing literature acknowledges the significance of writing in our everyday lives for both professional and non-professional communication, such as through email (Ahmad, 2011). According to Williams and Beam (2019), new computer-based tools create new writing environments and new writing styles. Al-Jarf (2004) details a collaborative online writing project involving three EFL college instructors and their students from Ukraine, Russia, and Saudi Arabia. Egbert and Hanson-Smith (1999) highlight the significant role of computers in language teaching, particularly in composition. The traditional perspective in language classes emphasizes writing as a tool to reinforce oral language patterns, grammar, and vocabulary. However, there is a shift towards recognizing writing in a second language as a valuable activity in itself. The primary concern is defining what constitutes writing ability. According to Hughes (2003), a practical method proposed is to have individuals engage in writing as the most effective means of assessing their written communication skills. Online tools can contribute to a number of tasks, like detecting plagiarism and text rewriting or text spinning (Ansorge et al., 2021). Taken together to conduct the present study, the researchers mainly decided to pose two research questions as follows:

1) Do Internet-based applications, including Adobe Connect and BigBlueButton, improve written communication skills for intermediate EFL learners?
2) How do the students react to the role of online learning in fortifying their written communication skills?

3. Methodology

This study encompasses a predominantly quantitative sequential mixed-methods study, which includes a qualitative phase (Johnson & Christensen, 2012) to further enhance the study by conducting a semi-structured interview that can highly enhance the internal validity of the study (Dörnyei, 2007).

3.1. Participants

The sample consisted of 34 students (females: n=21, 61.8%; males: n=13, 38.2%; Mean age=21.14 SD=3.12) studying the English language at an English private institute in Quchan, selected based on convenience sampling. All of the participants were native speakers of the Persian language. They were working on the American English File 2 book. Initially, the participants' homogeneity was determined from their scores on the Oxford Placement Test (OPT). Indeed, in order to ensure a reasonably

homogenous level of proficiency among the participants, the researchers decided to include students who scored at the intermediate level on the OPT test for this study. Out of 60 students, after making them homogeneous, the ultimate number of students who remained to participate in this study was 34. In the qualitative phase of the study, the researchers selected six students (females: n=4, 66.7%; males: n=2, 33.3%; Mean age=21.42, SD=2.81) to participate in the qualitative phase of the study based on purposive sampling. The data were gathered until no new information was added.

3.2. Instruments

To measure the language proficiency of L2 learners, OPT, a language proficiency test consisting of 60 multiple-choice vocabulary and grammar questions, was employed. The test takers were classified into four levels of English language proficiency based on the scoring criteria: elementary (1-14), pre-intermediate (15-29), intermediate (30-44), upper intermediate (45-50), and advanced (50-60). Volunteers categorized as intermediate-level participants were incorporated into the current research.

To measure the students' written communication skills, IELTS TASK 2 writing band descriptors (academic version), confirmed by the British Council, IDP IELTS Australia, and the University of Cambridge ESOL Examination was used. According to the criteria (called band descriptor) outlined by the Cambridge English for Speakers of Other Languages (ESOL) Center, participants' writing abilities are evaluated based on criteria such as grammatical range and accuracy, lexical resources, coherence and cohesion, and task achievement. For each criterion, the participant is given a score of 1 to 9. The content validity of the pretest and posttest was checked by three experts in second language acquisition who were faculty members of the English department at the Islamic Azad University of Quchan. The tests were piloted before they were employed. The reliability coefficients of 0.72 for the pretest and 0.76 for the posttest, which were taken from IELTS TASK 2 writing, showed good values.

To explore the students' perspectives on the role of BigBlueButton and Adobe Connect in enhancing their written communication skills, semi-structured interview questions, including four interview questions designed by the researchers of the current study, were utilized. The questions centered on the students' familiarity with online applications, their experience and use of such tools in their English courses, their teachers' mastery over computer-aided tools and their help and feedback, and their own sensitivity and emotions with respect to software tools. Two experts in the ELT courses at the Islamic Azad University of Quchan checked the content validity of the questions.

3.3. Procedure

3.3.1. Data Collection

The study followed a straightforward procedure. Before the treatment phase, the students became homogenous in terms of language ability utilizing OPT, and following this, they were randomly assigned into two groups of 17 students. Prior to the treatment, the students' writing performance was measured utilizing an IELTS sample writing task 2. The treatment lasted fifteen sessions from January 2024 to April 2024, and the students attended online classes twice weekly. One group was exposed to BigBlueButton (Group A=17 students), and the other was exposed to the Adobe Connect application (Group B=17 students). To do so, the teacher, who was one of the authors of the present study, worked with both groups on writing sections of their textbook "American English File 2", and the materials were presented through the web-based tool. The teacher worked with the students on the activities and tasks during class, and they were asked to reproduce what was written in the texts in groups A and B. Each session lasted 90 minutes; however, the students were exposed to these activities during the last thirty minutes of the class to work on their written communication skills.

Students in both groups were required to install the needed software or application on their PC or Laptop as they could make use of computer-aided materials simultaneously, including the text, the audio, and the test answers. The teacher worked with the students on the writing tasks selected from their class textbook, and the students practiced their written communication skills through Internet-based activities. During the treatment, in group A, components of BigBlueButton were used in the class, including video messaging, instant messaging, file sharing, and screen sharing. In group B, several components within Adobe Connect were used in the class, including the ability to upload PowerPoint

slides, share a single window or the entire desktop with meeting attendees, send text messages to all or selected attendees, and share files from users' computers.

Following the treatment phase, the teacher administered an IELTS sample writing task 2 to them in both groups. Two raters measured the students' ability both in their pretest and posttest. Finally, to collect the students' responses to the interview regarding their perceptions of the role of online learning in writing performance, one of the researchers developed the questions in the English language, and the students were required to reply to the questions precisely.

3.3.2. Data Analysis

As for the first research question of the study, ANCOVA was run to compare the significant difference between the two groups while controlling the pretest scores as the covariance. As for the second research question of the study, the researchers made use of "theme-based categorization" (Dörnyei, 2007, p. 245) to label the responses emerging from the open-ended interview questions. The inter-rater reliability for coded transcripts was also taken care of since it requires that the two coders choose the same code for the same unit of text (Krippendorff, 2004).

4. Results

4.1. Internet-Based Application and Written Communication Skills

Regarding the first research question of the study, the researchers performed the ANCOVA formula. Prior to conducting One-way ANCOVA, several assumptions needed to be satisfied. Initially, an examination was conducted to check the general distribution of scores for both experimental groups. There was no evidence of a curvilinear relationship since the linear nature of the relationship indicated that there was no breach in the assumption of linearity. Furthermore, there was no violation of the assumption of homogeneity of regression slopes since the significant value was .06, which was comfortably above the cut-off point (Tabachnick & Fidell, 2001).

Table 1
Descriptive Statistics for Written Communication Skills

Group	Mean	Std. Deviation	N
Adobe Connect	81.70	9.83	17
BigBlueButton	69.64	9.99	17
Total	75.67	11.52	34

As shown in Table 1, descriptive statistics for both groups showed that the Adobe Connect group had a mean score of 69.64, with a standard deviation of 9.99. On the other hand, the BigBlueButton group had a mean score of 81.70, with a standard deviation of 9.83.

Table 2
The ANCOVA Test for Written Communication Skills

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
group	394.31	1	394.31	12.02	.00	.27

As exhibited in Table 2, the results of ANCOVA indicated that there was a significant difference in the students' scores on written communication skills for intermediate EFL learners in the Adobe Connect group and the BigBlueButton group after adjusting for scores on the pretest conducted prior to the intervention. Indeed, the significance value was .00, which was less than .05. Upon comparing the mean scores of both groups, it was evident that the Adobe Connect group performed better than the BigBlueButton group in terms of written communication skills following the intervention.

4.2. Content Analysis of the Results Emerged from the Interviews

Concerning the second objective of the study, the researchers conducted interview sessions with six participants, including three students from each group, utilizing theme-based categorization and

following the data saturation method. Six EFL learners were chosen based on purposive sampling, and the students were interviewed to find out in-depth information. Some of the responses that emerged from the interviews are reported below.

One of the students said *"I previously felt that online learning was not hands-on, but gradually I appreciated it as beneficial, especially for distance learning and in severe situations like the coronavirus. The teacher did her best to write the collocations on the screen and upload and share similar materials and related paragraphs for us. One problem was the Internet speed and the connection that was breaking up at times".*

Students believed that using computerized tools was really challenging since there was no face-to-face interaction. Nevertheless, for practicing writing tasks it was rather helpful since, unlike listening and speaking skills, working on writing development does not need that much face-to-face social interaction. He stated, *"While working on conversational skills, I encountered words that were taxing to know their meanings and the teacher was there to assist, and we could practice various activities on this platform. However, working on written communication skills was a novel experience, and I knew that I had more concentration and fewer grammatical mistakes".*

Furthermore, the information that emerged from the responses by the students who were exposed to BigBlueButton revealed that the students were not focusing on the tasks, although the platform was suggested to be lighter than Adobe Connect, and they did not have focused participation and involvement. However, they believed that they had fewer Internet problems. One of the students said, *"The experience was inspiring for me as I could see how the teacher provided feedback on my writing clearly via the application using different colors, and I can see that I'm fonder of being alone while studying. However, the need for extra equipment was a bit of a problem, and I was deprived of effective feedback from the teacher".*

Afterward, the researchers assessed the inter-coder reliability of the data collected from the interviews. After completing the coding process, the first researcher shared the coded data with the second researcher. Subsequently, the second researcher coded the responses by identifying shared characteristics and arrived at broadly comparable findings, albeit with slight variations. The inter-coder agreement of the findings was ensured as both coders reached the same conclusion. Based on the recommendations proposed by Campbell et al. (2013), the researchers initially computed the ratio of coding agreements to the total number of agreements and disagreements. Ten frequent themes were identified, with at least one researcher applying a code to each. Among these themes, six occurrences were identified when both coders had used the same code. Hence, the inter-coder dependability would have been 60% based on the six out of 10 calculation, resulting in a value of 0.62. Hence, the data analysis revealed nine distinct codes encompassing the common themes in the responses (see Table 3).

Table 3
Some Excerpts Emerged from the Interviews

Participants	Excerpts	Themes
Interviewee A	When the teacher presented the materials, I found them new and informative, so I learned them with careful attention.	innovative
Interviewee B	Working on written communication skills was hard for me but using extra equipment helped me retain the collocations.	fruitful in learning collocations
Interviewee C	It was the first time I encountered online learning and let's say it was both interesting and difficult.	challenging
Interviewee D	I really found this online learning effective since commuting from home to the institute takes my time.	useful for distance learning
Interviewee E	I think that using different colors creates a situation that leads to unforgetting the materials.	colorful
Interviewee F	Internet problems such as the slow speed and the breaking-up connection are agonizing, indeed.	bad Internet connection

As shown in Table 3, the responses were as follows: innovative, fruitful in learning collocations, challenging, useful for distance learning, colorful, and bad Internet connection. The commonalities that emerged from the students' responses revealed that it was a novel experience and a challenging task to work on writing tasks. They could work on structural patterns better than other skills since they could focus on the task. However, they were not happy with internet speed and inadequate access to computer-aided tools such as smartphones and laptops. Altogether, they believed that Adobe Connect as an online platform is better than BigBlueButton because the teacher can upload different writing excerpts in Adobe Connect and can break out rooms to improve students' writing development and ask them to practice new collocations in different writing activities. Although BigBlueButton is lighter than Adobe Connect, the teacher cannot manage the class easily. Furthermore, the teacher is able to manage time and class on Adobe Connect better.

5. Discussion

The results of the present study showed that there was a significant difference in the students' written communication skills scores since the Adobe Connect group was confirmed to have better performance than the BigBlueButton group. The responses from the interviews also confirmed that the use of online learning is beneficial, especially in distance learning and when face-to-face interaction becomes hard. Actually, computer-assisted materials have the potential to be enhanced to include a sector of education that has not received much attention until now: computer-assisted education.

Concerning the first objective of the study, the obtained results are in line with the previous studies, such as Fotos and Browne (2004) and Abbasian and Modarresi (2023), who confirmed that online teaching has a positive impact on language learning. The results of the study are in agreement with the previous study conducted by Hamidi and Rahimpour (2023), who found that using smartphones could enrich the communicative ability of EFL students. The findings of the current research also indicated that computer-based tools have the potential to improve students' writing abilities and promote self-directed learning through self-awareness. Likewise, Lamy and Goodfellow (1999) found that computer-assisted programs can offer appropriate feedback to learners. Of course, as commented by Preece et al. (2002), providing both support from the teachers and feedback from the automatic computer contribute well to the development of learning, and the present study also highlighted that merged feedback has been actually recommended by experts and teacher who have been using CALL in their classrooms and their teaching methods.

Concerning the second objective of the study, the results that emerged from the interviews are in line with the previous research by Cameron (1999) and Lambropoulos et al. (2006), who found that digital tools enhance involvement and interactive learning opportunities. Consistent with prior studies, such as the one by Mohammadzadeh and Rahimpour (2024), which highlighted the positive impact of online teaching on language development, students show a preference for utilizing computer resources and tools like Adobe Connect, among others. The current research is in agreement with the study conducted by Anwaruddin (2013) and Hosseini and Modarresi (2015), who concluded that technological tools can improve students' academic advancement, allowing them to integrate seamlessly into learners' personal lives, enabling independent learning regardless of time and location. In the same vein, Modarresi (2019, 2022) highlighted the role of engagement in developing written communication skills. Educators in Iran have recently emphasized the potential of computer-assisted language learning. Actually, the convenience of technological tools in everyday tasks has expanded the use of computer-based materials in various crucial areas of life, including academic pursuits. Yaghooty et al. (2015) correctly predicted that Iran's culture may lead to the substitution of EFL teachers with technology within the next fifteen years. Indeed, a lack of motivational factors may lead to demotivation and dropout (Modarresi & Javan, 2018; Modarresi et al., 2021).

The researchers have concluded that written communication skills enhance students' language ability since they can make use of the software facilities to integrate written communication skills into other skills, raise their awareness of grammatical mistakes, and improve their grammatical patterns. Indeed, students who have a good grasp of computer, Internet, and typing skills are more likely to improve their language skills. This is because they are required to answer questions on a computer, and their

familiarity with computer software significantly contributes to their success in these examinations. Point taken, Kern and Warschauer (2000) concluded that the advancement of L2 pedagogy in CALL has led to the establishment of a teaching setting where the target language is acquired via online learning, focusing on new types of instructions such as hint-based instruction (Jalilzadeh et al., 2020; Rouhani & Modarresi, 2023). As in language teaching, the shift has been from contrived conversation to real-life interaction. Tthe results also confirmed that computer-aided learning enhances learning a second language.

EFL learners are recommended to utilize digital tools such as e-portfolios and computerized dynamic assessments to track their progress and identify areas for improvement. In addition to receiving guidance and feedback from teachers, students can also take advantage of electronic feedback. It is advised that they enhance their familiarity with computer-aided tools and Internet-based applications and make an effort to engage with other scholars and educators through platforms such as the Internet and computerized programs for second language acquisition. As for second language teachers, they are required to join in teacher education workshops and conferences on online learning to get familiar with new teaching agendas, apply new technological tools in their classrooms, and inspire the students to make use of the Internet and email to interact in the English language. Second language educators can hold teacher training courses for in-service and pre-service teachers to learn how to make use of Internet-based applications.

Although this study offers some informative insights, it has a number of limitations. First, care should be taken in terms of the generalizability of the findings since the sample is not representative of all pre-intermediate EFL learners. Moreover, more longitudinal research with a longer duration can investigate the extent to which online teaching can foster written communication skills. Second, due to the limited number of students available, the study included no control group. Actually, while the use of a control group is typically recommended, in some circumstances, the inclusion of a control group might not be possible for practical reasons (Mackey & Gass, 2016). The present study focused on the role that online tools can play in EFL students' writing development. Research needs to be done in relation to other language skills. Finally, more research with a larger sample size needs to be done to verify the findings of the present study.

Disclosure Statement

Funding

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