



MARAGHEH  
INTERNATIONAL UNIVERSITY



Printed ISSN: 2676-5587  
Online ISSN: 2676-5985

# The Impact of Dropbox Paper as an Online Collaborative Tool on the Academic Writing Skills of Iranian EFL Learners

Shima Taheri<sup>1</sup>, Hooshang Khoshsiman<sup>2\*</sup>, Ali Beikian<sup>3</sup>,  
Amir Mohammadian<sup>4</sup>

<sup>1</sup>PhD Candidate, English Language Department, Chabahar Maritime University,  
*67shtaheri@gmail.com*

<sup>2\*</sup> (corresponding author) TEFL Professor, English Language Department, Chabahar  
Maritime University. *khoshsima2002@yahoo.com*

<sup>3</sup> Assistant Professor of Translation Studies, English Language Department, Chabahar  
Maritime University. *a\_beikian@yahoo.co.uk*

<sup>4</sup> Assistant Professor of Linguistics, English Language Department, Chabahar Maritime  
University. *amir.mohamadian@cmu.ac.ir*

---

## Article info    **Abstract**

---

Article type:  
Research  
article

Received:  
2024/10/28

Accepted:  
2024/12/30

Technology integration into language learning has appeared as a prominent research focus in the past few years. The present study aimed to investigate the comparative effects of using Dropbox Paper as an online collaborative tool versus traditional non-collaborative writing instruction on the academic writing skills of Iranian EFL learners across varying proficiency levels. The research utilized a quasi-experimental research design, focusing on the collection and analysis of quantitative data. A total of 90 Iranian EFL learners were selected through convenience sampling and randomly assigned to either the experimental group, which utilized Dropbox Paper for collaborative academic writing, or the control group, which engaged in non-collaborative writing methods. Each group contained 45 learners with three different proficiency groups, i.e., high, mid, and low. The instructional phase included a pretest, followed by targeted instruction on academic essay writing for two months for both groups. Collaborative practices using Dropbox Paper as an online collaborative tool to write comments and notes and to receive teacher and peer feedback on their writings were considered for the experimental group and only direct teacher feedback for the control group, culminating in a posttest to evaluate the outcomes. The findings highlighted the need to align technology-enhanced writing instruction with learners' proficiency levels. Collaborative tools like Dropbox Paper are more effective for mid and high-proficiency learners, emphasizing the importance of scaffolding for lower-proficiency learners to ensure equitable benefits. These insights provide practical guidance for integrating collaborative tools into EFL classrooms to optimize writing instruction.

**Keywords:** academic writing, dropbox paper, online collaboration, proficiency

Cite this article: Taheri, S., Khoshsima, H., Beikian, A., & Mohammadian, A. (2025). The impact of dropbox paper as an online collaborative tool on the academic writing skills of Iranian EFL learners. *Journal of Modern Research in English Language Studies*, 12(3), 101-127.

DOI:10.30479/jmrels.2024.21117.2441

©2025 by the authors. Published by Imam Khomeini International University.

This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution 4.0 International (CC BY 4.0) <https://creativecommons.org/licenses/by/4.0>



## 1. Introduction

The integration of technology into English language instruction has emerged as a crucial strategy for addressing persistent challenges within language acquisition, particularly in the realm of writing (Knox, 2020). Writing tasks, often constrained by time pressures, expose learners to significant barriers that inhibit their development (Kessler, 2020; Liu et al., 2023; Stapleton & Radia, 2010; Wang, 2022). In an age where communication technologies are advancing at a breakneck pace, the necessity for proficient writing skills cannot be overstated. These skills are essential not only for effective academic discourse but also for navigating the complexities of real-world interactions (Shahrokhi & Taheri, 2016). Olshtain (2001, p. 206) underscores the pivotal role of writing in communication, asserting, "The skill of writing enjoys special status—it is via writing that a person can communicate a variety of messages to a close or distant, known or unknown reader or readers." This assertion highlights the critical importance of writing in contemporary society, where it serves as a fundamental predictor of academic success and a vital component of civic engagement and economic participation (Graham & Perin, 2007; Lee, 2017; Rahimi & Fathi, 2022).

Despite its significance, writing remains a complex and often daunting task, even for native speakers. Olshtain and Celce-Murcia (2000) aptly note that even a professional writer, who often writes for different purposes, does not necessarily find the writing process easy. The difficulties inherent in initiating writing tasks and refining drafts are compounded by the demands of a competitive, technology-driven global economy. Today's students are expected to produce an array of documents—including proposals, reports, letters, emails, and briefings—efficiently and persuasively, necessitating an urgent enhancement of their writing capabilities (Shahrokhi & Taheri, 2016).

In response to these challenges, online collaborative tools have garnered increasing attention in higher education, particularly in the case of language teaching. These platforms facilitate collaboration, self-reflection, resource sharing, and peer feedback, thereby fostering a more interactive and engaging learning environment. Collaborative learning, as emphasized by Soller (2001), not only promotes social interaction but also enhances knowledge acquisition and sharing among learners. Zioga and Bikos (2020)

asserted that meaningful engagement in collaborative learning requires learners to actively process assigned material by formulating ideas, testing assumptions, and articulating knowledge within their groups. This dynamic not only enriches individual understanding but also cultivates a collective intelligence that benefits all participants.

However, the traditional classroom setting often restricts the collaborative potential of learners, limiting the time available for meaningful interaction and peer contribution. In contrast, online environments eliminate these constraints, allowing for deeper engagement and iterative feedback processes (Hewitt & Scardamalia, 1998). Given the pervasive difficulties that EFL learners face with writing tasks, the adoption of online collaborative methods such as Dropbox Paper promises to enhance their writing proficiency through sustained peer support and collaborative refinement.

This study aims to critically investigate the effect of Dropbox Paper as an online collaborative tool on improving the academic writing skills of Iranian EFL learners. In pursuit of this objective, the research seeks to answer the following questions:

1. Is there any significant difference in the writing performance of Iranian EFL learners who use Dropbox Paper as an online collaborative tool compared to those employing a non-collaborative method?
2. Is there any significant difference in the academic writing performance of Iranian EFL learners with varying proficiency levels who utilize Dropbox Paper as an online collaborative tool?

## **2. Literature Review**

### **2.1. Theoretical Framework**

The theoretical underpinnings of collaborative writing are deeply rooted in Vygotsky's (1978) assertion that cognitive development flourishes through peer scaffolding and constructive interactions with knowledgeable individuals. This framework suggests that learners can significantly expand their Zone of Proximal Development (ZPD) through engagement with more proficient peers (Chaiklin, 2003). However, this theory must be critically examined in the context of modern technological advancements, which offer unprecedented avenues for collaborative learning. The Social Cognitive Theory further supports this paradigm, emphasizing that knowledge acquisition is intricately tied to social interactions and observational learning. It posits that through observation, practice, feedback, and self-evaluation, learners can effectively enhance their skills. Writing remains the most challenging language skill for many ESL/EFL learners, despite various instructional methods employed in writing courses. Since the 1970s, collaborative writing has been proposed as a solution to address this issue.

(Pardede, 2024). In this regard, online collaborative tools emerge as pivotal, facilitating rich environments for observation and practice that can enhance writing skills in ways that traditional methods often cannot.

## **2.2. Online Collaborative Tools in EFL Writing Classes**

Writing is considered a communicative framework of language teaching. As writing in English is a prerequisite for many university majors and future professions, it is considered essential for academic success (Shooli et al., 2020). In line with this, the surge in technological innovations facilitating both individual and group writing processes has sparked significant interest in online collaborative writing. As Razak et al. (2018) point out, EFL educators are increasingly incorporating these online tools into their classrooms to bolster students' language proficiency and collaborative capabilities. This trend reflects a necessary evolution in educational practices, moving beyond conventional in-class interactions to a more holistic approach to language acquisition.

The advent of virtual and augmented realities, alongside online learning platforms, has fundamentally transformed pedagogical approaches (Buchner & Kerres, 2023). The increasing enrollment in online courses underscores the necessity for institutions to adapt to this shifting landscape, as evidenced by the rise from 1.6 million online learners in 2012 to over 7.1 million by 2014 in the U.S. (Kolowich, 2014). Such statistics highlight the pressing need for educators to embrace technology as a means to meet the demands of contemporary learning environments. Also, Esfandiari and Allaf-Akbary (2024) in a study revealed evidence that the incorporation of technology-enhanced tools in the language classroom is an applicable option.

Among the myriad online tools available, Dropbox Paper has garnered attention as a valuable platform for promoting collaboration in EFL writing classes. This free, web-based tool facilitates real-time collaborative writing, allowing instructors to oversee student interactions and enabling comprehensive access to previously completed projects. The simultaneous viewing, revising, and editing capabilities of Dropbox Paper cultivate a collective engagement that is vital for effective writing practices.

A wealth of empirical research has elucidated the positive effects of Web 2.0 technologies, including weblogs and wikis, on improving writing competencies within second language contexts (e.g., Fathi & Nourzadeh, 2019; Muluk & Dahliana, 2024; Shahrokhi & Taheri, 2016; Strobl, 2013). These platforms have become essential in creating interactive and collaborative writing environments, facilitating not only language practice but also promoting active learning and teamwork (Hafner & Ho, 2020; Reinhardt, 2019; Saricaoglu, 2019). As EFL educators increasingly recognize the potential of technology to address the limitations of traditional instruction

(Rahimi & Fathi, 2022; Xu, 2021), the focus on collaborative online writing tools becomes ever more relevant.

However, despite the appeal of such tools, the specific effects of Dropbox Paper on the academic writing skills of Iranian EFL learners remain largely unexplored. While some recent studies, such as those by Dincer and Bal (2024), Alyafaei and Mudhsh (2023), and Dobakhti and her colleagues (2023), have investigated the pedagogical implications of online collaboration tools, a comprehensive review of existing literature on this topic is notably absent. This lack of thorough exploration signifies a gap in understanding how Dropbox Paper specifically influences academic writing skills in this demographic.

Several pertinent studies have begun to establish a foundation for this research. For instance, Jalili (2024) assessed the effects of utilizing Google Docs, which is in nature somehow similar to Dropbox Paper, a study comparing online collaborative writing using Google Docs with individual face-to-face classroom writing was conducted on 32 Iranian EFL learners. The findings revealed that Google Docs offered an efficient and affordable solution for L2 writers to share drafts with peers and instructors, facilitating feedback and comments. This approach fostered the improvement of writing skills both in traditional classroom settings and beyond, enhancing the overall writing performance of the participants.

Wang (2017) investigated the impact of various cloud-based tools, including Dropbox, on writing learning, revealing improved learning performance among participants. Similarly, Moreno (2012) demonstrated the effectiveness of Dropbox in enhancing student outcomes in English language acquisition.

Despite these valuable insights, the research landscape remains sparse regarding the application of online collaborative tools among Iranian EFL learners, particularly when considering varying proficiency levels. Although comparative studies, such as those conducted by Marandi and Seyyedrezaie (2017), have highlighted the benefits of Google Drive over traditional methods, the distinctive impact of Dropbox Paper on enhancing academic writing skills in this context is yet to be systematically examined.

This study aimed to fill this significant gap by investigating the specific effects of Dropbox Paper on the academic writing skills of Iranian EFL learners. Doing so, it will contribute novel insights into the pedagogical applications of online collaborative tools, providing a clearer understanding of their effectiveness across different proficiency levels. In a rapidly evolving educational landscape, such findings are essential for informing best practices and enhancing the writing competencies of EFL learners.

### 3. Method

#### 3.1. Participants

A total of 90 Iranian undergraduate participants, majoring in Translation studies, TEFL, and English language and literature were selected through volunteer and convenience sampling. Participants were drawn from four institutions: Chabahar Maritime University, Boushehr University, Isfahan University, and Shahid Beheshti University. Random assignment was employed to assign participants to either the experimental or control group, each with 45 learners, ensuring an equitable distribution of characteristics across both groups. To determine their language proficiency levels, the Oxford Quick Placement Test (OQPT) was administered, categorizing the members of each group into three proficiency levels: high, mid, and low. A control group with 45 learners contained 15 of each proficiency level, the same as the experimental group. Ethical considerations were strictly adhered to, including obtaining informed consent and ensuring the confidentiality of participants' data throughout the study.

#### 3.2. Materials and Instruments

To achieve the objectives of the present study, several data collection instruments were employed, described as follows:

##### 3.2.1. *Oxford Quick Placement Test (OQPT)*

The OQPT was administered before the experiment to assess the participants' current language proficiency levels. Developed by Oxford University Press and Cambridge ESOL, this widely recognized assessment tool comprises 60 multiple-choice questions designed to measure English language proficiency flexibly. Participants were categorized into three proficiency levels based on their scores: scores above 48 indicated upper-intermediate (high proficiency), scores between 30 and 47 indicated intermediate (mid proficiency), and scores below 30 indicated low proficiency. The duration of the test was 20 minutes.

##### 3.2.2. *Dropbox Paper as an Online Collaborative Tool for Academic Writing*

In contrast to the control group, which employed a non-collaborative writing method, the experimental group used Dropbox Paper as an online collaborative tool for academic writing. Participants were instructed on different aspects of academic writing, including structure, coherence, and argumentation. Additionally, they were trained in the collaborative functionalities of Dropbox Paper, which allows users to share documents, provide real-time feedback, and engage in peer reviews. This tool fosters an interactive writing environment, enhancing the learning experience.



### **3.2.3. Pre and Posttests**

To assess participants' initial writing proficiency, the IELTS General Writing Test was administered as a pretest before the intervention. This baseline measure included two writing topics, with participants being required to respond to one topic while adhering to specific criteria. The responses were collected and scored according to the IELTS writing scale in which the criteria of task achievement, coherence and cohesion, lexical resource, and grammatical range and accuracy were checked. Each criterion was worth 25% of the total mark for that task and was rated from 0 – 9, with increments of 0.25, 0.5, and 0.75. Following the two-month intervention, a posttest was conducted using the same procedure to evaluate the impact of Dropbox Paper on participants' academic writing skills.

### **3.3. Procedure**

The data collection procedure for this paper was structured into three main phases: the pre-test phase, the intervention phase, and the posttest phase. In the pre-test phase, the study commenced with the administration of the Oxford Quick Placement Test (OQPT) to all participants. This test was conducted in a controlled environment to minimize distractions and ensure consistency. Participants received clear instructions on the test format and were allowed 20 minutes to complete the assessment. Following the proficiency assessment, the IELTS General Writing Test was administered to evaluate the participants' academic writing skills. Each participant was required to write on one of two provided topics, taking into consideration specific prompts that highlighted key aspects of academic writing. Participants were given 40 minutes to complete this task, after which the collected writing samples were scored by experienced raters using the IELTS scoring criteria. This scoring assesses coherence and cohesion, task achievement, lexical resource, and grammatical range and accuracy.

The intervention phase involved the experimental group engaging with Dropbox Paper as a collaborative writing tool. This phase included several instructional sessions, each lasting approximately two hours. During this time, participants received explicit instruction on academic writing, covering essential elements such as thesis statements, argument development, paragraph structure, and citation practices. This instruction aimed to enhance their understanding of effective writing techniques. Concurrently, participants were trained in the functionalities of Dropbox Paper. They were guided on how to create, share, and collaboratively edit documents, with an emphasis on the importance of peer feedback and collaborative writing. This training encouraged participants to engage with one another's work throughout the process. Throughout the intervention, participants in the experimental group engaged in multiple collaborative writing tasks using Dropbox Paper. They

were assigned specific writing prompts related to their academic fields and worked in pairs or small groups to draft, review, and revise their work. Instructors monitored these sessions, providing support and guidance as needed.

In the posttest phase, after the two-month intervention, a posttest identical in structure to the pre-test was administered to all participants. This included a second administration of the IELTS General Writing Test to measure any changes in academic writing skills attributable to the intervention. Participants once again wrote on one of the two provided topics, adhering to the same criteria as in the pre-test. The responses were collected and scored using the IELTS writing scale, allowing for comparative analysis with the pre-test scores.

### **3.4. Data Analysis Procedures**

The data collected through these phases provided a comprehensive understanding of the impact of Dropbox Paper on the academic writing skills of Iranian EFL learners across varying proficiency levels. Descriptive statistics, including means and standard deviations, were employed to analyze the data and determine the central tendencies and variability of participants' writing scores. Inferential statistics, specifically t-tests for the first research question, and ANOVA for the second one, were utilized to compare the means of the experimental and control groups and to assess the impact of the Dropbox Paper intervention on academic writing skills across different proficiency levels. The rationale for using both tests simultaneously was to address the distinct needs of each research question. The t-test was appropriate for comparing the differences between the two groups (experimental and control) at a specific proficiency level, while ANOVA allowed for the examination of differences in writing scores across multiple groups based on proficiency level. Together, these tests provided a comprehensive and rigorous analysis, capturing both the overall effectiveness of the intervention and its varying effects across proficiency levels.

## **4. Results and Discussion**

### **4.1. Results**

#### ***4.1.1. Analysis of OQPT***

The 90 students were divided into two groups—control and experimental—each with 45 students. These students were assessed using the OQPT to determine their English language proficiency levels, which were categorized into three tiers: high, mid, and low proficiency.



The control group included 15 students at each proficiency level. The high-proficiency students, with OQPT scores ranging between 49 and 60, demonstrate a strong command of the English language. Mid-proficiency students, scoring between 30 and 48, possess a moderate level of proficiency, capable of managing general communication but potentially struggling with more complex language. Low proficiency students, with scores below 30, exhibit a basic understanding of English, likely needing significant improvement in their language skills.

Similarly, the experimental group mirrors this distribution, with 15 students at each proficiency level, ensuring an equal representation of high, mid, and low-proficiency students. The assignment of random OQPT scores within each proficiency category further indicates that the students were evenly and fairly distributed across both groups, maintaining a balanced and controlled study environment.

#### ***4.1.2. The First Research Question***

To respond to the first research question, the descriptive statistics provided below offer a preliminary understanding of the data from both the control and experimental groups before any intervention was applied.

The control group obtained mean scores of 6.29 (1st rater) and 6.30 (2nd rater), while the experimental group obtained slightly lower mean scores of 5.80 (1st rater) and 5.82 (2nd rater). This suggests that, on average, the writing performance of students in the control group was slightly higher than those in the experimental group before any intervention.

The results of the correlation analysis for the control group confirmed a significant and strong relationship between the scores that the two raters were assigned. The Pearson correlation coefficient was  $r = 0.992$ , indicating that the correlation is statistically significant. This high correlation suggests that the inter-rater reliability of the pretest scores for the control group is extremely high, meaning that the two raters were consistent in their scoring.

Also, the correlation analysis for the experimental group confirmed a highly significant relationship between the scores assigned by the two raters. The Pearson correlation coefficient was  $r = 0.995$ , with a  $p$ -value  $< 0.01$ . This extremely high correlation indicates that the inter-rater reliability of the scores of the pretest of the experimental group is consistent, ensuring that the ratings provided by both raters align closely.

**Table 1***Descriptive Statistics of the Experimental and Control Groups on Pretest*

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Pretest - Control Group (1 <sup>st</sup> Rater)	45	1.00	9.00	6.2889	2.09840
Pretest - Control Group (2 <sup>nd</sup> Rater)	45	.50	8.50	6.3000	2.09002
Pretest - Experimental Group (1 <sup>st</sup> Rater)	45	.50	8.50	5.8000	2.20640
Pretest - Experimental Group (2 <sup>nd</sup> Rater)	45	1.00	8.50	5.8222	2.10291
Valid N (listwise)	45				

The two sets of scores for the writing pretest, which were rated by two raters, were averaged for each score and their mean was calculated and considered as the final score. Table 2 presents the descriptive statistics for the pretest scores of the control and experimental groups.

**Table 2***Descriptive Statistics for the Pretest Scores*

Group Statistics					
	Groups	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Control Group	45	6.2944	2.08981	.31153
	Experimental Group	45	5.8111	2.15200	.32080

The independent samples t-test was applied to determine if there was a statistically significant difference between the pretest scores of the control group and the experimental group. The results are shown in Table 3.

Levene's test was used to check if the variances of the control and experimental groups were equal. F value of 0.339 and a significance level (Sig.) of 0.562 indicated that the variances were not significantly different ( $p > 0.05$ ). An independent samples t-test was run. The results revealed that there was no statistically significant difference between the means of both groups in pretest results ( $p > 0.05$ ). The null hypothesis that states there is no difference in the variances between the groups is rejected by the result of Levene's Test for Equality of Variances. This suggests that, at the beginning of the study, both groups had comparable writing proficiency levels, as measured by their pretest scores.

**Table 3***Independent Sample T-test on Pretest Scores of Experimental and Control Groups*

Independent Samples Test		Levene's Test for EOVs		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
Pretest	Equal variances assumed	.339	.562	1.081	88	.283	.48333	.44717	-	1.37200
	Equal variances not assumed			1.081	87.924	.283	.48333	.44717	-	1.37201
									.40533	.40534

The following table presents the descriptive statistics for the posttest scores of the control and experimental groups as assessed by two independent raters. This information provides an overview of the participants' writing performance in the control group after the intervention, allowing for a comparison of consistency and variability between the two raters' assessments.

**Table 4***Descriptive Statistics of the Experimental and Control Groups on Posttest*

Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	
Posttest - Control Group (1 <sup>st</sup> Rater)	45	2.00	9.00	6.8333	1.55578	
Posttest - Control Group (2 <sup>nd</sup> Rater)	45	3.00	9.00	6.8667	1.41983	
Posttest - Experimental Group (1 <sup>st</sup> Rater)	45	4.00	9.00	7.0333	1.21262	
Posttest - Experimental Group (2 <sup>nd</sup> Rater)	45	4.50	9.00	7.1444	1.22763	
Valid N (listwise)	45					

Both raters' assessments of the scores of the posttest for the control group are consistent, with mean scores of 6.83 and 6.87, respectively. The standard deviations indicate a moderate level of variability in scores, with the first rater showing slightly more variability than the second rater. The two sets of scores for the writing posttest, which were rated by two raters, were averaged for each score. The mean of these scores was calculated and considered as the final posttest score. Table 5 shows the descriptive statistics for the posttest scores of both groups.

**Table 5**

*Descriptive Statistics for the Posttest Scores of the Control and Experimental Groups*

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Posttest - Control Group	45	2.50	9.00	6.8500	1.48036
Posttest - Experimental Group	45	4.25	8.75	7.0889	1.21210
Valid N (listwise)	45				

In the control group, the scores varied from 2.50 to 9.00, with a mean of 6.85 and a standard deviation of 1.48. In the experimental group, the scores ranged from 4.25 to 8.75, with a mean of 7.09 and a standard deviation of 1.21. An independent samples t-test was performed to examine whether there is a statistically significant difference in the posttest scores between the control group (non-collaborative method) and the experimental group (Dropbox Paper as a collaborative tool).

**Table 6**

*Independent Sample T-test Between the Posttest Scores of the Control Group and the Experimental Group*

Independent Samples Test		t-test for Equality of Means								
		Levene's Test for EOVS								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
								Lower		Upper
Posttest	Equal variances assumed	.290	.592	.838	88	.405	.23889	.28522	-.32792	.80570
	Equal variances not assumed			.838	84.702	.405	.23889	.28522	-.32823	.80600

The results of Levene's Test for Equality of Variances revealed that the assumption of equal variances was met, as evidenced by a non-significant F value ( $F = 0.290$ ,  $p = 0.592$ ). Consequently, the t-test assuming equal variances was used.

The t-test results indicated no statistically significant difference between the control and experimental groups' posttest scores, with  $t(88) = 0.838$  and a p-value of 0.405, which is greater than the 0.05 significance level. This suggests that the use of Dropbox Paper as an online collaborative tool did not lead to a measurable improvement in academic writing skills compared to

the traditional method employed by the control group. Consequently, it can be concluded that both groups performed similarly in their writing assessments following the intervention.

#### 4.2.3. The Second Research Question

A Two-Way Mixed ANOVA was used to investigate the effect of Iranian EFL Iranian EFL learners' English proficiency level on their academic writing skills improvement when using Dropbox Paper as an online collaborative tool. The data were analyzed by the use of a Two-Way Mixed ANOVA, which examines the interaction between the independent variables: time (pretest vs. posttest), group (experimental vs. control), and proficiency level (low, mid, high).

Before interpreting the results of the Two-Way Mixed ANOVA, several assumptions were checked, including the equality of covariance matrices and the equality of error variances across groups. These assumptions ensure that the data meet the requirements for valid ANOVA results.

Box's Test of Equality of Covariance Matrices: This test examines whether the observed covariance matrices of the dependent variables are equal across groups. The results are shown in Table 7.

**Table 7**

#### *Box's Test of Equality of Covariance Matrices*

Box's Test of Equality of Covariance Matrices	
Box's M	54.229
F	3.396
df1	15
df2	38594.288
Sig.	.000
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	
a. Design: Intercept + groups + EXCTRL	
Within Subjects Design: Time	

The Box's M test yielded a significant result ( $p < .001$ ), indicating that the assumption of equal covariance matrices was violated. However, ANOVA is robust to moderate violations of this assumption, especially with large sample sizes. Despite this violation, the analysis proceeded with caution, and results were interpreted in light of this limitation.

**Levene's Test of Equality of Error Variances:** This test checks whether the error variance of the dependent variable is equal across groups. The results are shown in Table 8.

**Table 8**

*Levene's Test of Equality of Error Variances*

Levene's Test of Equality of Error Variances				
	F	df1	df2	Sig.
Pretest	5.355	5	84	.000
Posttest	3.430	5	84	.007

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + groups + EXCTRL  
Within Subjects Design: Time

Levene's test results represent significant differences in error variances for both pretest ( $p < .001$ ) and posttest ( $p = .007$ ) scores. This violation of the homogeneity of variances assumption suggests that caution is needed when interpreting the ANOVA results. However, ANOVA can be somewhat robust to such violations, particularly when sample sizes are equal across groups. The results of two-way ANOVA are shown in Table 9.

The time effect was found to be significant across all tests, with a very large effect size (Partial Eta Squared = .833), which indicates that the writing performance of all learners was improved significantly from the pretest to the posttest.

The interaction between time and group was also significant, with a partial eta squared value of .794, in a way that the improvement in writing skills differed between the experimental and control groups. This suggests that the use of Dropbox Paper had a differential effect on writing skills over time depending on the group. Similarly, the interaction between time and proficiency level was significant, with a partial eta squared value of .436, which means the impact of time on writing improvement varied depending on the learners' English proficiency level, suggesting that proficiency levels influenced how much learners benefited from the collaborative tool over time.



**Table 9**  
*Multivariate Tests*

Multivariate Tests		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	
Time	Pillai's Trace	.833	428.309 <sup>b</sup>	1.000	86.000	.000	.833	
	Wilks' Lambda	.167	428.309 <sup>b</sup>	1.000	86.000	.000	.833	
	Hotelling's Trace	4.980	428.309 <sup>b</sup>	1.000	86.000	.000	.833	
	Roy's Largest Root	4.980	428.309 <sup>b</sup>	1.000	86.000	.000	.833	
	Time *	Pillai's Trace	.794	166.238 <sup>b</sup>	2.000	86.000	.000	.794
groups	Wilks' Lambda	.206	166.238 <sup>b</sup>	2.000	86.000	.000	.794	
	Hotelling's Trace	3.866	166.238 <sup>b</sup>	2.000	86.000	.000	.794	
	Roy's Largest Root	3.866	166.238 <sup>b</sup>	2.000	86.000	.000	.794	
	Time *	Pillai's Trace	.436	66.468 <sup>b</sup>	1.000	86.000	.000	.436
EXCTRL	Wilks' Lambda	.564	66.468 <sup>b</sup>	1.000	86.000	.000	.436	
	Hotelling's Trace	.773	66.468 <sup>b</sup>	1.000	86.000	.000	.436	
	Roy's Largest Root	.773	66.468 <sup>b</sup>	1.000	86.000	.000	.436	
	a. Design: Intercept + groups + EXCTRL							
	Within Subjects Design: Time							
b. Exact statistic								

The tests of between-subjects effects evaluate the impact of group membership (experimental vs. control) and English proficiency level on the average improvement in writing skills of Iranian EFL learners. This analysis helps to determine whether there are significant differences in writing performance between EFL learners with different proficiency levels and whether the use of Dropbox Paper as a collaborative tool significantly affects these differences. The results are presented in Table 10.

The significant level ( $p < .001$ ) indicates that, on average, there is a significant overall improvement in writing skills across all participants, regardless of group or proficiency level. The effect of proficiency level (high, mid, low) on writing improvement is highly significant ( $F(2, 86) = 72.028$ ,  $p < .001$ ), with a large effect size (partial eta squared = .626). This suggests that the learners' proficiency level has a significant effect on their writing improvement, confirming the effectiveness of using Dropbox Paper as a collaborative tool.

The effect of group membership (EXCTRL) is not significant ( $F(1, 86) = .297$ ,  $p = .587$ ), with a negligible effect size (partial eta squared = .003). In this case, the group to which the learners belong does not significantly affect their improvement in writing skills when considered independently of the group effect.

**Table 10**  
*Tests of Between-Subjects Effects*

Tests of Between-Subjects Effects						
Measure: MEASURE_1						
Transformed Variable: Average						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	7631.022	1	7631.022	3375.707	.000	.975
Groups	325.647	2	162.823	72.028	.000	.626
EXCTRL	.672	1	.672	.297	.587	.003
Error	194.409	86	2.261			

The results from the multivariate tests indicate that Iranian EFL learners' English proficiency level significantly affects their improvement in academic writing skills when using Dropbox Paper as an online collaborative tool. The interactions between time and group membership, as well as between time and proficiency levels, were found to be significant. This suggests that both proficiency levels and group membership influence the extent of improvement in learners' writing skills, highlighting the importance of these factors in the efficacy of online collaborative writing tools.

Tukey HSD test was applied to compare the academic writing improvement of Iranian EFL learners with different proficiency levels of low, mid, and high. The results can be seen in Table 11. The significant negative mean difference (-2.4750, Sig. = .000) indicates that learners with low proficiency levels improved significantly less in their academic writing compared to those with mid-proficiency levels. The confidence interval does not include zero (-3.1297 to -1.8203), which confirms the robustness of this difference. This suggests that learners at a low proficiency level may struggle more with improving their academic writing, even with the use of a collaborative tool like Dropbox Paper. These learners might need additional support or tailored instructional strategies to help them progress.

Similarly, the mean difference of -3.1208 (Sig. = .000) shows a significant and even larger gap in improvement between low and high-proficiency learners. The confidence interval (-3.7755 to -2.4662) further supports this strong and statistically significant difference. The large difference highlights the challenges that learners with low proficiency face in comparison to their counterparts with high proficiency. It suggests that higher proficiency learners are better able to leverage the collaborative features of Dropbox Paper

to improve their writing. This might be due to better overall language skills, enabling them to engage more effectively in collaborative tasks.

**Table 11**

*Tukey HSD Test*

Multiple Comparisons						
Tukey HSD	MEASURE_1					
(I) Proficiency	(J) Proficiency	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Low Proficiency	Mid Proficiency	-2.4750*	.27450	.000	-3.1297	-1.8203
	High Proficiency	-3.1208*	.27450	.000	-3.7755	-2.4662
Mid Proficiency	Low Proficiency	2.4750*	.27450	.000	1.8203	3.1297
	High Proficiency	-0.6458	.27450	.054	-1.3005	.0088
High Proficiency	Low Proficiency	3.1208*	.27450	.000	2.4662	3.7755
	Mid Proficiency	0.6458	.27450	.054	-0.0088	1.3005

Based on observed means.

The error term is Mean Square (Error) = 1.130.

\* The mean difference is significant at the .05 level.

The mean difference (-0.6458) between mid and high-proficiency learners was not statistically significant (Sig. = .054), though it was close to the criterion of .05. The confidence interval (-1.3005 to 0.0088) includes zero, indicating that we cannot conclusively say there is a difference between these groups. The lack of a significant difference suggests that mid and high-proficiency learners may benefit similarly from collaborative tools like Dropbox Paper. Both groups likely have the necessary language skills to make effective use of such tools, resulting in comparable levels of improvement in their academic writing.

The Tukey HSD test reveals a clear pattern: learners with low English proficiency significantly lag behind the learners with mid and high proficiency in terms of academic writing improvement. The difference between mid and high-proficiency learners, however, is not statistically significant, indicating that these groups improve at a similar rate.

## 4.2. Discussion

This study aimed to investigate the impact of using Dropbox Paper as an online collaborative tool on the academic writing skills of Iranian EFL learners, particularly examining differences across proficiency levels. This discussion contextualizes the findings within the broader landscape of previous research on collaborative writing and language learning technologies, revealing both alignments and contradictions, along with implications for pedagogical practices and future research trajectories.

With regard to the first question, the results of the t-test did not reveal a statistically significant difference in the writing performance of Iranian EFL learners who used Dropbox Paper in comparison to those who engaged in non-collaborative methods. This outcome stands in contrast to previous studies by Moreno (2012), Wang (2017), and Alsahil (2024), which indicated significant improvements in the writing performance of learners who utilized cloud-based collaborative tools such as Google Docs, Dropbox, or similar platforms. These studies found that the incorporation of cloud-based platforms into writing tasks encouraged active engagement, peer collaboration, and increased writing quality, fostering a greater understanding of the writing process among learners. Wang (2017), for instance, reported that learners engaged with collaborative tools not only demonstrated improved writing quality but also exhibited a deeper understanding of writing strategies, which resulted in better overall performance. Similarly, Alsahil (2024) observed that platforms like Google Docs facilitated peer feedback and collaborative revisions, significantly contributing to the enhancement of learners' writing skills.

However, in the present study, the absence of statistically significant improvements in writing performance raises important questions regarding the effectiveness of collaborative writing tools in the Iranian EFL context. Several factors may have contributed to this unexpected outcome, which requires careful examination of both the research design and the broader context in which the study was conducted. One plausible explanation lies in the duration and depth of the intervention. Vygotsky's (1978) socio-cultural theory underscores the importance of sustained interaction for cognitive development, particularly in learning tasks that demand higher-order thinking and collaborative effort. In line with Vygotsky's theory, the relatively short duration of the intervention in this study was likely insufficient for learners to develop the collaborative skills needed to fully benefit from the features of Dropbox Paper. Previous studies, such as those by Razak et al. (2018) and Marandi and Seyyedrezaie (2017), which reported significant improvements in writing performance, generally involved longer, more immersive interventions where learners had ample opportunity to engage meaningfully with the tools. The limited time frame in the current study may not have

provided learners with sufficient exposure to and practice with Dropbox Paper to unlock its full potential for writing improvement.

In addition to the duration of the intervention, the nature of the writing tasks used in the current study may have played a significant role in the lack of improvement observed. The writing tasks may have been designed in ways that allowed learners to rely on their existing individual writing skills rather than promoting deep collaborative engagement. This observation aligns with Bandura's (1986) Social Cognitive Theory, which emphasizes the importance of self-regulation in skill development. If learners were already adept at completing individual writing tasks independently, the additional collaborative features of Dropbox Paper might not have provided significant added value. This supports the findings of Fathi and Nourzadeh (2019), who argued that self-regulated learners may benefit more from traditional writing practices than collaborative platforms. For learners already proficient in managing their writing processes, the collaborative aspect of Dropbox Paper may have felt supplementary or unnecessary, thus limiting the observed improvements in writing performance.

Moreover, contextual factors unique to the Iranian educational environment may have contributed to the results of this study. The Iranian context is characterized by limited access to technology, unreliable internet connections, and varying levels of digital literacy among learners. These factors could have impeded learners' ability to fully engage with Dropbox Paper and make use of its collaborative features. As Li and Zhang (2020) pointed out, the effectiveness of digital tools is contingent upon the learners' access to technology and their proficiency in using it. In the Iranian EFL context, learners may not have had the technological fluency or consistent access required to engage fully with the platform. For instance, if learners struggled to use Dropbox Paper due to inadequate technological skills or insufficient access to reliable internet, the tool's collaborative features would have been underutilized, which could explain the lack of improvement in writing performance. Thus, while collaborative platforms have proven effective in more technologically advanced contexts, the technological limitations in the Iranian context may have hindered learners' ability to use Dropbox Paper to its full potential.

In addition, the learners' familiarity with Dropbox Paper and its functionalities could also have impacted the results. If learners were not well-versed in using Dropbox Paper or had not been adequately trained to leverage its features, they may not have maximized the potential benefits of the tool. The initial learning curve associated with adopting a new tool may have detracted from their focus on writing tasks, thus reducing the overall effectiveness of the platform in improving writing skills. Therefore, despite the potential benefits suggested by previous studies, the learners in this study may

not have had enough time or exposure to Dropbox Paper to develop the proficiency needed to use it effectively for collaborative writing.

Regarding the second question, the results revealed a significant discrepancy in writing improvements between low-proficiency and mid or high-proficiency learners. Specifically, low-proficiency learners showed significantly less improvement in their writing performance than their higher-proficiency counterparts. This result aligns with the findings of Bikowski and Vithanage (2016), who reported that learners with stronger language foundations are better able to utilize collaborative platforms like Google Docs, thereby reaping more substantial benefits. These learners can engage more effectively in peer feedback, revision processes, and collaborative tasks, which are essential for improving academic writing. The research suggests that learners with a higher level of language proficiency possess the necessary cognitive and linguistic resources to engage deeply with collaborative tasks, making the collaborative nature of Dropbox Paper more beneficial for them.

The findings of this study can be understood through the lens of cognitive load theory, which posits that learners with lower proficiency levels often face greater cognitive demands when performing complex tasks, such as writing. Low-proficiency learners may struggle to generate and organize ideas, leading to a situation where the collaborative tool's potential is underutilized. When these learners attempt to use a collaborative tool, the added cognitive load of navigating the platform, interacting with peers, and incorporating feedback may detract from their ability to focus on improving their writing. In contrast, higher-proficiency learners, who have already mastered fundamental writing skills, are better able to handle the additional cognitive demands of collaboration, thus making them more likely to benefit from the platform's collaborative features.

Interestingly, mid and high-proficiency learners did not show a significant difference in their writing improvements, indicating that once learners reach a certain proficiency threshold, the benefits of using Dropbox Paper for collaborative writing may plateau. This finding is consistent with Ayan and Seferglu (2017), who found that learners with sufficient language proficiency exhibited similar levels of improvement in writing when using collaborative tools. The lack of significant difference between these two groups suggests that, at higher proficiency levels, learners may already possess the necessary skills to produce quality academic writing, making the collaborative features of Dropbox Paper less impactful. This observation aligns with Razak et al. (2018), who noted that learners at higher proficiency levels often benefit less from collaborative tools because their writing performance is already at an advanced level.

Furthermore, the results of this study point to the importance of tailored instructional strategies for low-proficiency learners. While collaborative tools



like Dropbox Paper have the potential to improve writing outcomes, they may not be as effective for learners who struggle with foundational language skills. To maximize the effectiveness of such tools for low-proficiency learners, educators may need to incorporate additional scaffolding strategies, such as providing explicit writing instruction, offering targeted peer feedback, and ensuring that learners receive sufficient support in navigating the platform. This approach resonates with the findings of Watanabe and Swain (2007), who argued that scaffolding is crucial for maximizing the benefits of collaborative writing tasks. Without proper support, low-proficiency learners may not be able to fully engage with or benefit from collaborative writing tools.

In conclusion, this study suggests that while collaborative tools like Dropbox Paper have the potential to improve writing performance, their effectiveness is influenced by several factors, including the duration of the intervention, the proficiency level of the learners, and contextual considerations such as access to technology. For high-proficiency learners, the tool may provide additional value in refining writing skills, while for low-proficiency learners, additional support and scaffolding may be required to ensure meaningful engagement and improvement. These findings emphasize the need for educators to consider the specific needs of their learners and the context in which they operate when incorporating collaborative tools into the language learning process.

## 5. Conclusion and Implications

The present study investigated the impact of Dropbox Paper, an online collaborative tool, on the academic writing skills of Iranian EFL learners, with a particular emphasis on different proficiency levels. The findings revealed no statistically significant difference between the writing performance of learners who used Dropbox Paper and those who engaged in non-collaborative methods. However, significant discrepancies were noted among proficiency levels, with low-proficiency learners benefiting less from the collaborative tool in comparison to their mid and high-proficiency counterparts. These results underscore the importance of considering learners' proficiency when integrating collaborative tools into writing instruction, as higher-proficiency learners tend to better leverage these tools for skill enhancement.

These findings can have both theoretical and practical implications. From a theoretical point of view, the present study contributes to both Social Cognitive Theory (Bandura, 1986) and Vygotsky's (1978) Sociocultural Theory, specifically the concept of the Zone of Proximal Development (ZPD). The findings affirm Social Cognitive Theory by showing that collaboration can enhance learning outcomes when learners possess sufficient foundational skills. Additionally, Vygotsky's ZPD is supported by the observed challenges faced by low-proficiency learners, who may not receive adequate scaffolding in a collaborative context without supplementary instructional support. This

emphasizes that while collaborative tools like Dropbox Paper can foster learning, their effectiveness is contingent upon learners' existing language skills, confirming the critical role of tailored scaffolding in collaborative writing environments.

The practical implications of the present study are significant for EFL educators and curriculum developers. Online collaborative tools such as Dropbox Paper can be highly beneficial for mid and high-proficiency learners. Educators should consider integrating these tools into their writing instruction for these groups, as they promote engagement, peer feedback, and improved writing outcomes. However, for low-proficiency learners, it is imperative to implement additional instructional strategies, such as targeted scaffolding, differentiated tasks, or individualized feedback, to help them utilize collaborative tools more effectively. Furthermore, educators should be mindful of the duration of interventions, ensuring that students have ample time to acclimate to the collaborative features of such tools.

Nevertheless, several limitations warrant acknowledgment. First, the sample of the study comprised only Iranian EFL learners, which limits the generalizability of the findings to other cultural or educational contexts. Second, the intervention period may have been too brief for learners, particularly those at lower proficiency levels, to fully capitalize on the collaborative tool. An extended intervention might yield different results. Additionally, the study focused exclusively on writing skills, whereas collaborative tools like Dropbox Paper could affect other language skills, such as reading or speaking, which were not examined here.

In terms of delimitations, the study exclusively included learners at three proficiency levels (low, mid, and high), and the collaborative tool used was specifically Dropbox Paper. The incorporation of other tools or different proficiency divisions could yield varied findings. Furthermore, the focus was solely on academic writing, excluding other writing genres that may interact differently with collaborative tools.

Future research should explore the impact of collaborative tools on learners from diverse cultural and educational backgrounds to enhance the generalizability of findings. Studies with extended intervention periods would provide insights into how prolonged exposure to collaborative writing tools affects learners' performance, particularly among lower proficiency levels. Moreover, research could examine the use of collaborative tools across different language skills (e.g., reading, speaking) to determine their broader educational impact. Lastly, future studies could investigate the effects of scaffolding techniques or individualized instructional strategies on the performance of low-proficiency learners in collaborative writing settings, offering more nuanced guidance for educators working with this population.

### **Acknowledgments**

We would like to express our special thanks to those who helped us achieve this project successfully, especially the learners who participated and dedicated their time and effort. Special thanks go to the teachers across Iran for encouraging their students to take part in the study. We also acknowledge Dropbox Paper for serving as the collaborative platform that supported our experimental approach.

## References

- Alsahil, A. (2024). Exploring students' perceptions and affordances of Google Docs-supported collaborative writing. *Innovation in Language Learning and Teaching*, 18, 1-19. <https://doi.org/10.1080/17501229.2024.2326030>
- Alyafaei, Y. & Mudhsh, B. A. (2023). A review study on the impact of online collaborative learning on EFL students' writing skills. *International Journal of Linguistics Studies*, 3(3), 8-18. <https://doi.org/10.32996/ijls.2023.3.3.2>
- Ayan, E., & Seferglu, S. S. (2017). Using Etherpad for online collaborative writing activities and learners with different language learning strategies. *Eurasian Journal of Applied Linguistics*, 3(2), 42-59. <https://doi.org/10.32601/ejal.461000>
- Bandura, A. (1986). Fearful expectations and avoidant actions as a coefficient of perceived self-inefficacy. *American Psychologist*, 41(12), 189-191. <https://doi.org/10.1037//0003-066x.41.12.1389>
- Buchner, J., & Kerres, M. (2023). Media comparison studies dominate comparative research on augmented reality in education. *Computers & Education*, 195, 1-12. <https://doi.org/10.1016/j.compedu.2022.104711>
- Celce-Murcia, M., & Olshtain, E. (2000). *Discourse and context in language teaching* (pp. 44-56). Cambridge University Press.
- Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. In Kozulin, A., Gindis, B., Ageyev, V. & Miller, S. (Eds.). *Vygotsky's educational theory and practice in cultural context*. Cambridge University Press.
- Dincer, N., & Bal, S. (2024). A Qualitative Journey on Instructors' Perceptions of Artificial Intelligence in EFL Education. In *AI in Language Teaching, Learning, and Assessment* (pp. 78-100). IGI Global. <https://doi.org/10.17576/apjitm-2021-1002>
- Dobakhti, L., Zohrabi, M., & Masoudi, S. (2023). Scrutinizing the utility of flipped and online instructions for ameliorating EFL learners' writing ability. *Journal of Modern Research in English Language Studies*, 10(3), 71-94. <https://doi.org/10.30479/jmrels.2023.18587.2192>
- Esfandiari, R., & Allaf-Akbary, O. (2024). The role of ChatGPT-based instruction and flipped language learning in metadiscourse use in EFL learners' argumentative writing and their perceptions of the two instructional methods. *Teaching English as a Second Language Quarterly (Formerly Journal of Teaching Language Skills)*, 43(3), 27-52. <https://doi.org/10.22099/tesl.2024.49975.3277>

- Fathi, J., & Nourzadeh, S. (2019). Examining the effects of writing instruction through blogging on second language writing performance and anxiety. *Issues in Language Teaching*, 8(1), 63-91.
- Graham, S., & Perin, D. (2007). What we know, what we still need to know: Teaching adolescents to write. *Scientific Studies in Reading*, 11(4), 313-336. <https://doi.org/10.1080/10888430701530664>
- Hafner, C. A., and Ho, W. Y. J. (2020). Assessing digital multimodal composing in second language writing: Towards a process-based model. *Journal of Second Language Writing*, 47(2), 100710. <https://doi.org/10.1016/j.jslw.2020.100710>
- Hewitt, J. and M. Scardamalia. (1998). Design principles for the support of distributed processes. *Educational Psychology Review* 10 (1), 75-96. <http://doi.org/10.1023/a:1022810231840>
- Jalili, Sh. (2024). Effect of online collaborative learning via Google Docs on writing performance of Iranian EFL learners. *International Journal of Foreign Language Teaching and Research*, 12 (48), 41-50. <https://doi.org/10.30495/JFL.2023.706285>
- Kessler, M. (2020). Technology-mediated writing: exploring incoming graduate students' L2 writing strategies with activity theory. *Computers and Composition*, 55, 1-20. <https://doi.org/10.1016/j.compcom.2020.102542>
- Knox, J. (2020). Artificial intelligence and education in China. *Learning, Media and Technology*, 45(3), 298-311. <https://doi.org/10.1080/17439884.2020.1754236>
- Kolowich, S. (2014). Can universities use data to fix what ails the lecture? *The Chronicle of Higher Education*.
- Lee, I. (2017). Portfolios in classroom L2 writing assessment. In *Classroom writing assessment and feedback in L2 school contexts* (pp. 105–122). Springer. [https://doi.org/10.1007/978-981-10-3924-9\\_8](https://doi.org/10.1007/978-981-10-3924-9_8)
- Li, T. & Zhang, Y. (2020). The construct of English competence and test design for non-English major postgraduates. *English Language Teaching*, 14(1), 58-63. <https://doi.org/10.5539/elt.v14n1p58>
- Liu, G. Z., Fathi, J., and Rahimi, M. (2023). Enhancing EFL learners' intercultural communicative effectiveness through telecollaboration with native and non-native speakers of English. *Computer-assisted Language Learning*, 36, 1-31. <https://doi.org/10.1080/09588221.2022.2164778>
- Marandi, S. S., & Seyyedrezaie, M. S. (2017). The multi-course comparison of the effectiveness of two EFL writing environments: Google Drive versus face-to-face on Iranian EFL learners' writing performance and writing apprehension. *CALL-EJ*, 18(1), 9-21.

- Moreno, J. de J. (2012). Using social network and Dropbox in blended learning: An application to university education. *Business, Management and Education*, 10(2), 220–231. <https://doi.org/10.3846/bme.2012.16>
- Muluk, S., & Dahliana, S. (2024). Investigating students' writing performance and attitude towards a Web 2.0-based flipped classroom instruction. *Jurnal Ilmiah Peuradeun*, 12(1), 137-164. <https://doi.org/10.26811/peuradeun.v12i1.1090>
- Olshtain, E. (2001). Functional tasks for mastering the mechanics of writing and going just beyond. In M.Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (3rd edition, pp. 206-217). USA Heinle & Heinle.
- Pardede, P. (2024). Collaborative writing in EFL settings: A review. *JET (Journal of English Teaching)*, 10(1), 92-109. <https://doi.org/10.33541/jet.v10i1.5631>
- Rahimi, M., and Fathi, J. (2022). Exploring the impact of wiki-mediated collaborative writing on EFL students' writing performance, writing self-regulation, and writing self-efficacy: A mixed methods study. *Computer-assisted Language Learning*. 35 (2), 7–267. <https://doi.org/10.1080/09588221.2021.1888753>
- Razak, N. A., Alakrash, H., & Sahboun, Y. (2018). English language teachers' readiness for the application of technology towards the fourth industrial revolution demands. *Asia-Pacific Journal of Information Technology and Multimedia*, 7(2), 89-98. [https://doi.org/10.17576/apjitm-2018-0702\(02\)-08](https://doi.org/10.17576/apjitm-2018-0702(02)-08)
- Reinhardt, J. (2019). Social media in second and foreign language teaching and learning: Blogs, wikis, and social networking. *Language Teaching* 5(2), 1-39. <https://doi.org/10.1017/s0261444818000356>
- Saricaoglu, A. (2019). The impact of automated feedback on L2 learners' written causal explanations. *ReCALL*, 31(2), 189-203. <https://doi.org/10.1017/s095834401800006x>
- Shooli, E., Rahimi Esfahani, F., & Sepehri, M. (2021). Impacts of the flipped classroom on micro/macro writing subskills in Iranian EFL context. *Journal of Modern Research in English Language Studies*, 8(4), 85-109. <https://doi.org/10.1155/2022/1530290>
- Soller, A. (2001). Supporting social interaction in an intelligent collaborative learning system. *International Journal of Artificial Intelligence in Education*, 12(1), 40-62. <https://doi.org/10.3133/ofr01223>
- Stapleton, P., and Radia, P. (2010). Tech-era L2 writing: Towards a new kind of process. *ELT Journal*. 64(2), 175-183. <https://doi.org/10.1093/elt/ccp038>



- Strobl, C. (2013). Affordances of Web 2.0 technologies for collaborative advanced writing in a foreign language. *Calico Journal*, 31(1), 1-18. <https://doi.org/10.11139/cj.31.1.1-18>
- Taheri, Sh., Shahrokhi, M. (2016). The impact of blog peer feedback on improving Iranian English foreign language students' writing. In *Handbook of Research on Foreign Language Education in the Digital Age* (pp. 365-386). IGI Global. <https://doi.org/10.4018/978-1-5225-0177-0.ch017>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wang, J. (2017). Cloud computing technologies in writing class: Factors influencing students' learning experience. *Turkish Online Journal of Distance Education*, 18(3), 197-213. <https://doi.org/10.17718/tojde.328954>
- Wang, Z. (2022). Computer-assisted EFL writing and evaluations based on artificial intelligence: A case from a college reading and writing course. *Library Hi-Tech*, 40(1), 80-97. <https://doi.org/10.1108/lht-05-2020-0113>
- Watanabe, Y., & Swain, M. (2007). Effects of proficiency differences and patterns of pair interaction on second language learning: collaborative dialogue between adult ESL learners. *Language Teaching Research*, 11(2), 121-142. <https://doi.org/10.1177/136216880607074599>
- Xu, J. (2021). Chinese university students' L2 writing feedback orientation and self-regulated learning strategies in online teaching during Covid-19. *The Asia-Pacific Education Research*, 30(6), 563-574. <https://doi.org/10.1007/s40299-021-00586-6>
- Zioga, c., & Bikos, K. (2020). Collaborative writing using Google Docs in primary education: Development of argumentative discourse. *The Turkish Online Journal of Distance Education*, 21(1), 133-142. <https://doi.org/10.17718/tojde.690372>