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Research Paper

## Effects of Wiki-Mediated Collaborative Writing on Iranian Intermediate EFL Learners' Written Complexity, Accuracy, and Fluency

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### Abstract

writing EFL learners' intermediate Iranian affected Wikis using collaborative online writing how examined study This complexity, accuracy, and fluency. The language proficiency of 75 EFL learners was gauged based on their performance on the Oxford Quick Placement Test (OQPT). They were intermediate male and female EFL learners studying English at three language institutes in Shahrekord, Iran. The participants were then split into two groups at random: a Wiki group (WG) and a control group (CG). Afterward, learners in the control and experimental groups were given a cause-and-effect prompt as a pre-test, and their writing complexity, accuracy, and fluency were assessed using CAF measures. Following the pre-test, the participants in the experimental group began a six-week training period in the collaborative environment of Wiki. The same instructional materials and procedures were presented to the control group but in a non-collaborative, face-to-face setting. Similar to the writing pre-test, a writing post-test was given to both groups at the end of the intervention, and the writings were graded. In comparison to the conventional methodology, the results obtained revealed that the instructional method via Wiki was advantageous and effective in enhancing writing skills. This result is consistent with theories supporting technology-based approaches in EFL writing settings. The main outcome of this research is that the ease and viability of teaching and learning writing are significantly and meaningfully influenced by giving learners control over their learning through Wiki. In fact, by fostering a culture of cooperation and collaboration to write development, EFL teachers can help students improve their writing skills by using Wikis. **Keywords:** Accuracy; Collaborative writing; Complexity; Fluency; Wikis; Writing skill

تأثیر نوشتن مشارکتی با واسطه ویکی بر پیچیدگی، دقت و روانی نوشتاری زبان آموزان ایرانی زبان انگلیسی متوسط این مطالعه بررسی کرد که چگونه نوشتن آنلاین مشارکتی با استفاده از ویکیها بر پیچیدگی، دقت و روانی زبانآموزان زبان انگلیسی زبانآموزان ایرانی تأثیر میگذارد. مهارت زبان 75 زبان آموز EFL بر اساس عملکرد آنها در آزمون قرار دادن سریع آکسفورد (OQPT) سنجیده شد. آنها زبان آموزان متوسطه مرد و زن زبان انگلیسی بودند که در سه مؤسسه زبان در شهرکرد، ایران، انگلیسی می خواندند. سپس شرکت کنندگان به طور تصادفی به دو گروه تقسیم شدند: یک گروه ویکی (WG) و یک گروه کنترل (CG). پس از آن، به فراگیران گروه های کنترل و آزمایش به عنوان پیش آزمون یک دستور علت و معلولی داده شد و پیچیدگی، دقت و روانی نوشتاری آنها با استفاده از معیارهای CAF ارزیابی شد. پس از انجام پیش آزمون، شرکت کنندگان در گروه آزمایشی دوره آموزشی شش هفته ای را در محیط مشارکتی ویکی آغاز کردند. همان مواد آموزشی و رویهها به گروه کنترل اما در یک محیط غیر مشارکتی و حضوری ارائه شد. مشابه پیش آزمون نوشتاری، در پایان مداخله از هر دو گروه پس آزمون نوشتاری داده شد و نوشته ها نمره گذاری شدند. در مقایسه با روش مرسوم، نتایج به دست آمده نشان داد که روش آموزشی از طریق ویکی در افزایش مهارتهای نوشتاری مفید و مؤثر است. این نتیجه با نظریه هایی که از رویکردهای مبتنی بر فناوری در تنظیمات نوشتن EFL پشتیبانی می کنند، سازگار است. نتیجه اصلی این تحقیق این است که سهولت و ماندگاری آموزش و یادگیری نوشتار به طور قابل توجهی و معنادار تحت تأثیر کنترل یادگیری به زبان آموزان از طریق ویکی است. در واقع، با پرورش فرهنگ همکاری و همکاری برای توسعه نوشتن، معلمان زبان انگلیسی می توانند به دانش آموزان کمک کنند تا مهارت های نوشتاری خود را با استفاده از ویکی ها بهبود بخشند.

کلمات کلیدی: دقت، نوشتن مشارکتی، پیچیدگی، روانی، ویکی ها، مهارت نوشتن

## Introduction

Writing is a crucial productive skill that can be used to learn other receptive and productive skills in a second language (L2) (Zhu, 2004). Writing stimulates thought and learning, motivates communication, and makes thought available for reflection (Mekheimer, 2005). Ideas can be reviewed, reexamined, rearranged, and changed after being put in writing. The importance of this crucial ability is emphasized by Olshtain (2001), who claims that the skill of writing enjoys special status-it is via writing, that a person can communicate a variety of messages to close or distant known or unknown readers.

Despite the writing's significance, L2 learners sometimes feel anxious or afraid when they are required to write (Arnold, 2007; Byrd, 2010; Zhu, 2004), which may prevent them from improving their writing abilities. Experts in the field frequently acknowledge the difficulty of writing. Nunan (1989), for instance, claims that learning to write frequently and expressively is the most difficult of the motor skills for all language users regardless of whether the language in question is a first, second, or foreign language. Producing a coherent, fluent, and lengthy piece of writing is arguably the hardest thing to do in a language, as it was highlighted by Nunan (1996). Richards and Renandya (2002) also emphasized that writing is the hardest skill for L2 learners to master.

L2 teachers can use a variety of resources to assist L2 students with this challenging skill. Utilizing technological innovations and tools that could be useful for educational purposes is one possibility. It seems promising to investigate the effects of using Wikis, as an example of a technological resource, on EFL learners' writing development, given the popularity of technological advancements in our daily lives and given the permeation of technology in almost every aspect of today's life. Wikis have gained popularity as a type of asynchronous computer-mediated communication (CMC) to aid in collaborative learning and writing instruction (Richardson, 2006; Lamb, 2004). Wikis, created by Leuf and Cunningham (2001), is a website that enables any user, or group of users, to create and edit a collection of hyperlinked web pages, even if they have little or no experience with web publishing (Mak & Coniam, 2008). Additionally, the majority of Wiki platforms include a discussion board where users can propose, edit, delete, and/or add to the web pages (Godwin-Jones, 2003). Wikis thus enable user engagement in the process of co-constructing texts and collaborative composition around their construction (Elola & Oskoz, 2010; Kessler, 2009; Lee, 2010; Li & Kim, 2016).

Computer-assisted language learning (CALL) researchers have shown a lot of interest in this online technological tool. The sociocultural theory of L2 acquisition (Lantolf, 2000; Lantolf & Appel, 1994) holds that interaction, and in particular focusing on language and language use as well as being engaged in collaborative dialogue (Swain, 2000), are essential processes in L2 learning through which students co-create knowledge about the target language. The basic tenets of this theory are, in fact, what spurred this interest in Wiki-mediated collaborative writing.

The number of studies examining the benefits of collaborative work for writing in L2 is relatively low when compared to research that examines the benefits of collaborative work for speaking (Storch, 2005; Storch & Wigglesworth, 2007). For instance, Storch (2005) asserts that although pair and group work are frequently used in language classrooms, very few studies have examined the nature of such collaboration when students produce a jointly written text. The majority of studies on collaborative writing in the L2 classroom have examined learners' attitudes toward group/pair work in general rather than to the practice of collaborative writing.

## Literature Review

According to Kinnear and Steinman (2011), sociocultural theory (SCT) emphasizes the connection between social communication and mental growth. This idea is built upon the theory



of Vygotsky (1978), which assumes that learning is a community task and that all upper-level cognitive tasks need assistance (Lantolf, 2000). The procedure by which humans use cultural notions, concepts, and activities to control, achieve lexical dominance, and change the physical universe or their own and other's social cognitive process, is referred to as mediation. On the basis of this theory, learning takes place when people interact in a social activity that is organized according to a particular culture (Kaufman, 2004). Lantolf and Thorne (2007) argued that participation in cultural, linguistic, and historically formed settings such as family life and peer interaction, as well as in institutional contexts like schooling, takes place during a person's mental growth process. Vygotsky asserted that during these exercises, children can, with the aid of external mediation, carry out any task that is beyond their current cognitive capacity.

Here, language takes the form of a cooperative conversation between social mediators (teachers/peers) to help other students' cognitive development (Mercer, 1996; Ohta, 2000, 2001). Mediation is, therefore, crucial from an SCT standpoint, but only in the Zone of Proximal Development (ZPD) where progress is most likely made. This is in contrast with what children can do on their own (their current ability) and what they can do with the help they receive from other mediators such as parents, teachers, peers, or cultural tools (their potential ability).

According to Mitchell and Myles (2004), applying the SCT perspective to language classrooms suggests that learning the target language results from engaging in a meaningful, culturally organized group activity where social interaction takes place. This should involve not only participating in the activity but also interacting with any output, including spoken words and written texts. SCT assumes that students identify linguistic gaps or problems in their own or another's language production while engaging in a collaborative activity and working together to find a solution by combining their language knowledge (Gutierrez, 2006).

Collaboration is defined as the process in which two or more learners need to work together to achieve a common goal, typically the completion of a task or the answering of a question (Beatty, 2010). The activity, which can be completed verbally, in writing, or electronically, encourages social interaction between students. Two students cooperating or conversing verbally while completing a task or activity is not always a sign of collaboration, according to Beatty and Nunan (2004). These researchers all agree that there are specific traits in learners' discourse and behaviors that reflect their engagement in a collaborative interaction. It is claimed that collaboration entails engaging in a crucial activity that necessitates students interacting with one another. Before arguing that collaboration occurred, students should engage in conversation to go over the essential details of the activity. This involves being clear about the steps to carry out the activity and achieve the goal, relying on each other's understanding, and setting intentions in order to maintain consensus and a mutual understanding that allows students to finish the activity.

Multiple authors use the process writing method to progress through the different writing stages (planning, drafting, etc.) collectively rather than individually, which is reflected in group writing exercises. Storch (2011) defines a collaborative writing activity as "the joint production or the co-authoring of a text by two or more writers in the context of language learning" (p. 257). Because co-authoring is a feature of collaborative writing, it is distinct from other types of writing. As a result, participants work together on every stage of the writing process as opposed to focusing on just one or adding text without taking into account what others have already written (Dale, 1994; Storch, 2013a). Therefore, participants brainstorm ideas, talk about the organization of the text, and edit both their own and one another's writing. As a result, the final product of the collaborative writing activity is a text that is shared by all participants and cannot be reduced to the individual contributions of each.

A computer-supported collaborative learning (CSCL) tool used to encourage group writing is the Wiki (Warschauer, 2010; Warschauer & Grimes, 2007). From an SCT standpoint, Wikis are

seen as a mediational tool that helps pupils focus on a single goal. Wikis are asynchronous collaboration tools with an open editing system as one of their features. It is essentially a topically-arranged collection of linked expanding web pages. Readers who browse these websites have the opportunity to read more in-depth content on a certain topic of interest (Yates, 2008). The editing, history record, and discussion areas are the three main function tabs of the Wiki platform's technical structure. Using the editing tab transforms a Wiki page into an editable page where readers can add content. Each tab has a distinct function. Each editing action performed on a certain Wiki page is listed chronologically on the history page. Every Wiki page also contains a discussion section where users can discuss topics relating to the information on the page. This forum is an online Wiki-threaded discussion. The platform can be used for both public (Wikipedia) and private (classroom projects) purposes and is extremely secure. Users can decide whether to let anybody view and utilize the editing tab or to restrict editing to logged-in users only because it has an open editing system.

In this section, some of the previous studies on the use of Wikis and writing are included. In Wichadee's (2010) study, the effectiveness of the students' ability to write an English summary was assessed by comparing the outcomes of one group's pre- and post-tests. This study involved 35 students who were enrolled in a Basic English course. Students worked in groups of four or five to produce five written texts in a Wiki-based setting. After completing the Wiki spaces tasks, the mean writing scores were compared between the two times. The results pointed to the positive effect of Wiki on writing.

Li's (2013) study examined archived logs from the Discussion and History Wiki features to ascertain how a small group of EFL students taking advantage of Wiki-based collaborative writing can be used as an example to show how this is done. Along with the examination of historical data, the interview was another technique that might provide better access to participant insight. The results of both the quantitative and qualitative phases of the study uncovered the positive effects of the application of Wikis.

In their study of how Wiki-mediated courses affected students' writing skills in ESP writing classes in Iran, Estaji and Salimi (2018) found a statistically significant difference between students who used Wiki and those who did not. They added that the majority of the ESP students believed the Wiki is a practical writing tool with significant benefits. More recently, Rahimi and Fathi (2021) looked into how Wiki-mediated collaborative writing affected EFL students' writing performance, self-regulation, and self-efficacy. They found that the Wiki-mediated collaborative writing group outperformed the non-Wiki collaborative writing group in terms of results for the EFL students. The EFL students' writing content, writing style, information sequencing, and language use (including grammar, vocabulary, and writing mechanics), as well as peer writing mediations, were all found to be affected by the Wiki environment. Further evidence of the EFL students' positive attitudes and views of Wiki-mediated collaborative writing came from their qualitative data analyses.

Another recent study was done by Dai, Wang, and He (2023) on the effect of wiki-based writing instruction on writing skills and writing self-efficacy of Chinese EFL learners. Fifty three EFL students from a Chinese foreign language school were chosen as volunteers for this purpose. The two courses were divided into two groups: experimental (N = 25) and control (N = 28). During the course of three months, the experimental group received wiki-based writing education, while the control group received traditional teaching. The data was gathered by delivering IELTS writing assignments as well as a writing self-efficacy measure for pre-and post-tests. Data analysis revealed that both groups significantly improved their writing ability and self-efficacy. Yet, the experimental group outperformed the control group in terms of both dependent variables, leading the researchers to conclude that wiki-based writing training was considerably

successful in improving Chinese EFL learners' writing skills and self-efficacy. These findings may have some useful consequences for EFL teachers.

The above-mentioned studies examined the effect of Wikis on writing, but none were concerned with the impact of Wiki on CAF in writing among Iranian EFL learners. Therefore, in this study, the following research question was raised:

Does Wiki-mediated collaborative writing have a significant effect on Iranian intermediate EFL learners' written complexity, accuracy, and fluency?

## **Method**

### **Participants**

The participants of the study were 50 EFL learners studying English at three separate language institutes in Shahrekord. They were selected based on their performance on the Oxford Quick Placement Test (OQPT) and assigned to two groups randomly (experimental and control, each containing 25 intermediate EFL learners). The sample included both male and female participants with Persian as their first language; the learners were adult EFL learners, ranging in age from about 20 to 35.

### **Instruments**

The first instrument employed in this study was the OQPT, a widely used and well-known language placement test. The 60 multiple-choice questions on vocabulary, grammar, and reading comprehension in the OQPT are scored according to a rubric, and those who obtained a score between 30 and 47 were classified as intermediate. Additional data-gathering instruments utilized in the study included writing pre- and post-tests. For the writing pre-test, the students were given a cause-and-effect prompt and were allowed 30 minutes to write a paragraph on. Two SLA instructors examined the prompt for validity and clarity before giving it to the learners. Two raters evaluated the students' written work, and the inter-rater reliability of their scores (83.6%) was estimated.

A writing post-test was administered following the completion of the treatment. This test was of the same type as the pre-test (i.e., cause-and-effect), and had a predetermined time limit, testing requirements, and scoring. The post-test was additionally examined for validity and reliability. Writing accuracy was operationalized as the number of error-free clauses, and writing fluency was measured by counting the number of words. Writing complexity was computed as the number of clauses per T-unit, where a T-unit is an independent clause plus any attached dependent clauses (Fathi & Rahimi, 2020).

### **Data Collection Procedure**

A homogenous sample of intermediate EFL learners was chosen to represent the population of intermediate English language learners at three language institutes in Shahrekord, Iran. The selected participants were then randomly assigned to a Wiki group (WG) and a control group, each containing 25 learners. A cause-and-effect pre-test was given to students in the control and experimental group, and their writing complexity, accuracy, and fluency were evaluated using CAF measures. Following the pre-test, the six-week treatment phase began for those who were a part of the experimental group. To be more specific, the students in the experimental groups first learned about Wikis and how it might be used for group writing projects. Afterwards, the WG received a weekly writing program. According to the program, the WG students were required to produce an essay on a specific topic each week. They worked together to complete the pre-writing (i.e., writing, planning, and revising) phase of the writing process. They submitted their writing assignments once they were finished so that their peers could provide feedback. Adjustments were made in light of group members' feedback. The teacher advised the pupils to

review the Wiki's history page and discuss the issues brought up by their peers. It was highlighted that they might utilize the information on the history page as a source for their upcoming writing tasks. During this process, which lasted eight weeks, the students were required to turn in eight writing projects.

For the control group, the steps of the writing process (pre-writing, drafting, and revising) were carried out in a face-to-face environment but without collaboration, using the same instructional materials. The students in this group all attended the same number of lessons, and only the teacher was in charge of providing feedback. The learners in the two groups were given a writing post-test that was analogous to the writing pre-test at the end of the intervention, and their CAF scores were compared. Inter-rater reliability coefficients were calculated for the writing pre-test and writing post-test after their writings were assessed by two different raters.

## Results

The obtained mean score and 5% Trimmed Mean for each group are shown in Table 1 below. The table demonstrates that the mean for each group and the 5 percent trimmed mean do not differ significantly. It demonstrates that the top and bottom 5% of extreme scores had little to no impact on the final mean scores.

**Table 1**

*Test Scores Normality: Descriptive Statistics for Participated Groups*

		Statistic	Std. Error
WG C pre-test	Mean	9.64	.23
	5% Trimmed Mean	9.65	
WG A pre-test	Mean	7.30	.28
	5% Trimmed Mean	7.28	
WG F pre-test	Mean	8.99	.16
	5% Trimmed Mean	8.94	
WG C post-test	Mean	17.58	.29
	5% Trimmed Mean	17.53	
WG A post-test	Mean	17.39	.20
	5% Trimmed Mean	17.33	
WG F post-test	Mean	18.48	.18
	5% Trimmed Mean	18.47	
CG C pre-test	Mean	9.63	.18
	5% Trimmed Mean	9.64	
CG A pre-test	Mean	8.54	.23
	5% Trimmed Mean	8.52	
CG F pre-test	Mean	7.44	.16
	5% Trimmed Mean	7.41	
CGCpost-test	Mean	14.18	.28
	5% Trimmed Mean	14.15	
CG A post-test	Mean	14.13	.15
	5% Trimmed Mean	14.14	
CG F post-test	Mean	14.46	.19
	5% Trimmed Mean	14.40	



Table 2. below shows the Tests of Normality according to Kolmogorov-Smirnov statistics. This assesses the normality of the distribution of scores. A non-significant result (Sig. value of more than .05) indicates normality.

**Table 2**  
*Tests of Normality*

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
WG C pre-test	.142	25	.200*	.964	25	.492
WG A pre-test	.127	25	.200*	.944	25	.182
WG F pre-test	.207	25	.007	.914	25	.038
WG C post-test	.196	25	.014	.867	25	.004
WG A post-test	.128	25	.200*	.936	25	.118
WG F post-test	.138	25	.200*	.930	25	.088
CG C pre-test	.164	25	.081	.909	25	.029
CG A pre-test	.171	25	.058	.942	25	.166
CG F pre-test	.150	25	.150	.947	25	.218
CG C post-test	.110	25	.200*	.964	25	.505
CG A post-test	.195	25	.015	.947	25	.210
CG F post-test	.171	25	.058	.936	25	.117

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

To determine if there was a statistically significant difference in the two groups' performance on the different components of the writing pre-test, one-way ANOVA was conducted. The statistics that were obtained are shown in the tables below. Table 3. demonstrates that the homogeneity of variances has significance values greater than .05 (.52, .36, and .05). Therefore, the assumption of homogeneity of variance has not been violated by the data.

**Table 3**  
*Test of Homogeneity of Variances for Different Components of Collaborative Writing.*

Collaborative Components	Levene Statistic	Df1	Df2	Sig.
Complexity	.64	2	72	.52
Accuracy	1.02	2	72	.36
Fluency	3.11	2	72	.05

The performance differences between the various groups are shown in Table 3 as being statistically significant. A significant difference in conventional group performance was seen, as shown by the multiple comparison calculation.

**Table 4**  
*Test of ANOVA for Different Components of Collaborative Writing.*

Collaborative Components	Df	Mean Square	F	Sig.
Complexity	2	.72	.64	.52
Accuracy	2	9.94	6.05	.004
Fluency	2	20.96	22.41	.000

A one-way analysis of covariances should be performed in order to obtain additional results because there is a significant difference between the performances of the groups based on their pre-test scores.

### Results of the Research Question

The following research question and hypothesis were the focus of the study:

Does Wiki-mediated collaborative writing have a significant effect on Iranian intermediate EFL learners' written CAF?

Wiki-mediated collaborative writing has no significant effect on Iranian intermediate EFL learners' written CAF.

**Table 5**

*Descriptive Statistics*

*Dependent Variable: Complexity of the Collaborative writing*

Grouping	Mean	Std. Deviation	N
Wiki Group	17.58	1.45	25
Conventional Group	14.18	1.41	25
Total	15.88	2.22	50

Table 5 lists the descriptive statistics for the members of the WG and CG groups (N = 25, SD = 1 point 45, M = 17 58). As a result, the WG group performed better on the complexity of collaborative writing, according to the obtained mean scores.

**Table 6**

*Levene's Test of Equality of Error Variances*

*Dependent Variable: Complexity of Collaborative writing*

F	df1	df2	Sig.
.991	1	48	.325

The p-value is higher than the alpha level (P=0.32), as shown in Table 6. As a result, the assumption of the equality of the variances has not been violated. The obtained difference between mean scores will be analyzed in Table 7 to determine whether it is significant.

**Table 7**

*Tests of Between-Subjects Effects*

*Dependent Variable: Complexity of Collaborative Writing*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	157.8 <sup>a</sup>	2	78.9	43.3	.000	.64
Intercept	241.4	1	241.4	132.4	.000	.73
Covariate	13.3	1	13.3	7.3	.009	.13
Group types	144.9	1	144.9	79.5	.000	.62
Error	85.6	47	1.8			
Total	12852.2	50				
Corrected Total	243.5	49				

a. R Squared = .648 (Adjusted R Squared = .633)

According to Table 7, the obtained difference between the mean scores is significant ( $P=.000<0.05$ ). Therefore, as the results show, using Wikis in the process of collaborative writing is effective, and students in the WG outperformed the CG group. According to Cohen (1988), a small effect size is indicated by the partial eta-square for this case, which is 0.62. For the covariate, 0.009 is the level of significance.

This shows that, after adjusting for the independent variable, there is a meaningful relationship between the covariate and the complexity of collaborative writing. The effect of the covariate is significant because the p-value is less than .05. In actuality, it contributed to the dependent variable's variance by explaining 13% of it. The obtained results from table 7 thus demonstrated that there are significant differences between the participant performances under wiki use. The findings also revealed a minor covariate intervention (meaningful variation in complexity between learners' performance in WG and CG conditions).

**Table 8**

*Grand Mean*

*Dependent Variable: Complexity of Collaborative Writing*

Mean	Std. Error	95% Confidence Interval	
		Lower Bound	Upper Bound
15.880 <sup>a</sup>	.191	15.496	16.264

Table 8 shows the mean scores for each condition in case of removing the intervention of the covariate.

**Table 9**

*Descriptive Statistics*

*Dependent Variable: Accuracy of the Collaborative Writing*

Grouping WGCG	Mean	Std. Deviation	N
Wiki Group	17.39	1.02	25
Conventional Group	14.13	.79	25
Total	15.76	1.88	50

The descriptive statistics for the members of the WG and CG groups are shown in Table 4.17 ( $N = 25$ ,  $SD = 1.02$ ,  $M = 17.39$ , and  $N = 25$ ,  $SD = 0.79$ ,  $M = 14.13$ ). The WG group performed better on the accuracy of collaborative writing, as evidenced by the obtained mean scores.

**Table 10**

*Levene's Test of Equality of Error Variances*

*Dependent Variable: Accuracy of the Collaborative Writing*

F	df1	df2	Sig.
1.55	1	48	.21

The p-value is greater than the alpha level, as shown in Table 10 ( $P=0.21$ ). As a result, the equality of the variances assumption has not been violated. If there is a significant difference between the mean scores, it will be discussed in Table 11.

**Table 11***Tests of Between-Subjects Effects**Dependent Variable: Accuracy of the Collaborative Writing*

Source	Type III Sum of			F	Sig.	Partial Eta Squared
	Squares	df	Mean Square			
Corrected Model	133.4 <sup>a</sup>	2	66.7	78.4	.000	.77
Intercept	294.6	1	294.6	346.6	.000	.88
Covariate	.58	1	.58	.68	.413	.01
Group types	114.8	1	114.8	135.1	.000	.74
Error	39.9	47	.85			
Total	12592.2	50				
Corrected Total	173.3	49				

a. R Squared = .770 (Adjusted R Squared = .760)

Table 11 demonstrates that the obtained difference for the mean scores is significant ( $P=.000 < 0.05$ ). As a result, using wikis in the collaborative writing process is successful, and the WG members outperformed those of the CG. According to Cohen (1988), a small effect size is indicated by the partial eta-square for this case, which is 0.74. For the covariate, 0.41 is the significance level. This suggests that, after adjusting for the independent variable, there is no meaningful relationship between the covariate and the accuracy of the collaborative writing. Since the p-value exceeds .05, the covariate's effect is not considered to be significant. In actuality, it contributed to the dependent variable's variance by 1%. The obtained results from table 11 thus demonstrated that there are significant variations in the participant performances under the Wiki treatment. The findings also revealed a minor covariate intervention (the significant accuracy performance gap between the learners' performance in the WG and CG conditions).

**Table 12***Grand Mean**Dependent Variable: Accpost WC*

Mean	Std. Error	95% Confidence Interval	
		Lower Bound	Upper Bound
15.760 <sup>a</sup>	.130	15.498	16.022

Table 12 shows the mean scores for each condition in case of removing the intervention of the covariate.

**Table 13***Descriptive Statistics**Dependent Variable: Fluency of the Collaborative Writing*

Group types	Mean	Std. Deviation	N
Wiki Group	18.48	.92	25
Conventional Group	14.46	.98	25
Total	16.47	2.23	50

Table 13 lists the descriptive statistics for the members of the WG (N=25, SD=0.92, M=18.48) and CG (N=25, SD=0.98, M=14.46) groups. Therefore, according to the calculated mean scores, the WG group performed better on the fluency of collaborative writing.

**Table 14**

*Levene's Test of Equality of Error Variances*

*Dependent Variable: Fluency of the Collaborative Writing*

F	df1	df2	Sig.
.869	1	48	.356

The p-value (P=0.35) is greater than the alpha level, as shown in Table 14. As a result, there has been no violation of the variances' equality assumption. Table 15 will discuss the significance of the obtained difference in mean scores.

**Table 15**

*Tests of Between-Subjects Effects*

*Dependent Variable: Fluency of the Collaborative Writing*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	203.3 <sup>a</sup>	2	101.6	112.9	.000	.82
Intercept	103.5	1	103.5	115.05	.000	.71
Covariate	1.3	1	1.38	1.5	.222	.03
Group Types	88.7	1	88.7	98.5	.000	.67
Error	42.3	47	.9			
Total	13808.7	50				
Corrected Total	245.7	49				

a. R Squared = .828 (Adjusted R Squared = .820)

Table 15 demonstrates that the obtained difference for the mean scores is significant ( $P=0.000 < 0.05$ ). Therefore, as the results show, using Wikis in the process of collaborative writing is effective, and students in the WG outperformed the CG group. According to Cohen (1988), the partial eta-square for this case is 0.67, which denotes a small effect size. The covariate's significance level is 0.22. This suggests that, when the independent variable is controlled for, there is no statistically significant relationship between the covariate and the fluency of the collaborative writing. The effect of the covariate is not significant because the p-value is higher than .05. In fact, it contributed to the explanation of 3% of the variance in the dependent variable.

As a result, the findings from table 15 demonstrated that the participant performances under the Wiki treatment scenario differ significantly from one another. Additionally, the results revealed a minor covariate intervention (meaningful variation in fluency performance between learners in WG and CG conditions).

**Table 16**

*Grand Mean*

*Dependent Variable: Fluency of the Collaborative Writing*

Mean	Std. Error	95% Confidence Interval	
		Lower Bound	Upper Bound
16.470 <sup>a</sup>	.134	16.200	16.740

Table 16 shows the mean scores for each condition in case of removing the intervention of the covariate.

### Discussion

A feature of wikis called Mutuality (Storch, 2002) enables students to collaborate on projects, seek for support, ask for aid, challenge or interact with one another's contributions, develop one another's ideas, and alter the text based on their suggestions. Another essential element is a collaborative dialogue, where students communicate with one another to make sense of other people's written language (Swain, 2000). The learners are socially engaged to create a warm atmosphere that will improve group cohesion. Over the course of the conversation and interaction, the written speech would increasingly get more complicated.

Wikis can be an efficient instrument for learning a variety of linguistic skills, according to the vast majority of past studies on their efficacy. Wikis have been shown to enhance writing and summarizing skills (Alshumaimeri, 2011; Mohammed, 2010; Wichadee, 2010; Wong, Chen, Chai, & Gao, 2011), develop content and grammatical knowledge (Castaeda & Cho, 2012; Pellet, 2012), encourage collaborative behaviors, and support collaborative writing activities (Arnold, Ducate, & Kost, 2009, 2012; Bradley et al., 2011). There is broad consensus among studies that giving users the ability to edit a Wiki page gives language learners lots of opportunities to interact critically with what others have written (i.e., the Wiki content) as well as edit and modify it. The discussion pages promote a range of cooperative behaviors because they provide pupils with a chance to debate the content. In other words, students can interact with the material in what Wells and Chang-Wells (1992) refer to as an epistemic mode, thanks to Wiki's technical architecture.

The findings of this study agreed with those of Wichadee's (2010) investigation. In this study, the student's proficiency in writing an English summary was assessed by contrasting the pre-and post-test scores for one group. The study's participants were composed of a group of 35 students taking a Basic English course. Students worked in groups of four or five to create five written texts in a Wiki-based setting. The mean writing scores were compared between the two times after the tasks were completed in Wiki spaces. The results demonstrated that the textual discourse mediated by Wiki benefited from increased intrinsic complexity. Lee (2010) looked into the potential usage of wikis with 35 students enrolled in a basic Spanish lesson. The three sources of data were wiki pages, student questionnaires, and final interviews. Hadjerrouit (2011) examined the outcomes of the students' collaborative writing in the wiki-based environment after it was completed. Eight students from a Norwegian university were chosen to work together on writing assignments for about eight weeks. Each of their studies found that collaborative Wikis can aid writers in improving their writing skills.

Learners participate in ongoing conversations about grammatical issues related to the text's content by working together to modify Wiki texts. The inclusion of all recommendations and comments would improve the quality of the final Wiki text. Nami and Marandi's (2014) study provided documentation of the interactive nature of S-S interaction on the Wiki discussion page. Their findings show how students participated despite not having to complete a collaborative writing assignment, as was the case in other studies (i.e., merely an online discussion tool), as other studies had done (the Wiki was used here). The collaborative practice between students that was most frequently noticed was asking and answering questions (68 percent). Students (16%) also provided feedback on their classmates' work. However, only 4% of students critiqued the writing of their classmates. The data demonstrated that students were actively engaging in group scaffolding, which is consistent with prior studies. After posting questions, students answered with a range of comments in which they exchanged ideas, supported one another's proposals, and



clarified language definitions. The students also took part in a group discussion where they discussed each other's posts' grammar. The other group members reacted to a group member's request for help by citing the textbook materials or the teacher's directions. The information also revealed that even after someone else had answered the question, other learners were still able to remark and make further responses. Nami and Marandi made the case that these cooperative behaviors changed individual knowledge into dispersed knowledge, increasing the correctness of written performance, in light of this.

According to the research, employing a cognitive and social tutoring method in wikis is essential for fostering a sense of community and enhancing students' accuracy and fluency. The first-time tutoring styles were discussed, Lamy and Goodfellow (1999) were referring to tutors who preferred cognitive (cognitive) conversation over social (social) socialization. According to the research by Hauck and Hampel et al., (2005), these tutor interventions have an effect on how students connect with one another (2001). For instance, in the cognitive tutor course, students talked about English and French in a more thoughtful manner, placing more of an emphasis on vocabulary and syntax (i.e., collaborative conversation). The cognitive tutor developed a work-related online scenario, asked questions pertaining to language, modeled the essential discussion, and more. Students were asked to upload social communication pieces during the social tutor's course in which they discussed subjects unrelated to the target language. Lamy and Goodfellow stressed the importance of integrating both approaches, but the study's participants were unable to do so.

Wiki is utilized in EFL classes to get students interested in the collaborative nature of writing. Richardson from 2006 Higdon's (2006) research indicates that using wikis to teach writing encourages participation and results in greater writing output than anticipated. According to Higdon (2006), Wiki can also be borrowed outside of the classroom, saving time on students' homework. A key principle of SLA is constructivism, which holds that knowledge can only be learned when people are actively involved in completing tasks and solving problems. One typically ponders and evaluates how well new concepts blend with the old after such an event. Yates (2008) examined student behavior while using a constructivist framework to work on a Wiki project. The goal of the study was to find out more about how a Wiki project might improve communication during in-person discussions as well as within the Wiki, which might then have an effect on writing fluency. The results demonstrated that teamwork and fluency had improved.

The collaborative and participatory writing capabilities of wikis help learners' overall language skills. Lin (2005) looked at how the collaborative writing and fluency of 20 college EFL students were changed by using wikis. Collaborative writing, according to the study, encourages writing fluency and improves English awareness and writing abilities (Lin, 2005). In addition, Lin's (2005) research found that underachievers use Wiki technology more frequently, which enables them to write collaboratively online in their Zone of Proximal Development (ZPD).

### Conclusion

A key component of language learning is writing. Limiting writing instruction to a classroom setting would not result in the correct development of this useful ability due to the time constraints that characterize in-person classes. In order to improve their pedagogical methods and the writing abilities of their pupils, language teachers can now use Web 2.0 technologies into their teaching tactics thanks to advancements in technology (Kessler et al., 2012). Students can collaborate more successfully with their peers using Web 2.0 tools wherever they are and whenever they need to finish an assignment. As a result, students get lots of chances to practice writing, which is essential for enhancing their writing abilities.

Wikis is essentially one of the many technical tools that can be utilized to improve students' writing. Regardless of their level of proficiency, the majority of EFL students like reading digital

texts to improve their language skills, especially their writing skills. Learning with digital texts appears to be pleasurable and successful for them due to their portability, affordability, and capacity to be stored on their computers or mobile devices. Learning is affordable since students can assess their writing skills for free via Wikis. However, there are designated locations on the Wiki where students can access digital literature for educational purposes. For the integration of language learning, it is essential.

As stated earlier, the goal of the current study was to compare the growth of writing skills among Iranian EFL students utilizing Wikis as a technological tool. The purpose of the study was to investigate whether adopting Wikis in place of conventional teaching strategies had any significant effects on EFL learners' writing skills. The study's findings demonstrated that this tool is essentially useful and effective at enhancing writing skills when compared to the conventional methodology. The findings are consistent with the hypotheses that back up the use of technology-based approaches in teaching EFL writing. The findings support Zou's (2006) assertion that computer technology aids in the development of writing skills, as well as Hyland's (2002) assertion that computer-mediated instruction can improve writing abilities.

By demonstrating how the use of Wiki as a platform for collaboration and feedback enhances writing quality, this study contributes to the body of knowledge in the field of second language learning. This is consistent with Achterman's (2006) findings, which highlight the Wiki's contribution to enhancing the nature of student participation. Similar conclusions were reached by Lamb (2004), who recommends Wiki as a source that is more interested in the writing process than the finished output. The study's deductions and conclusions suggest that Wikis greatly helped people improve their writing skills by providing opportunities for online feedback.

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