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Impact of Collaborative Writing Through Google Docs on Iranian Intermediate EFL Learners' Written Complexity, Accuracy, and Fluency

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Abstract
This study examined how Iranian intermediate EFL learners' writing complexity, accuracy, and fluency were affected by collaborative online writing using Google Docs. 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. Participants were chosen through convenient sampling. The participants were then randomly split into two groups: a Google Docs group and a control group. 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 groups began a six-week training period in the collaborative environments of Google Docs. 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. Compared to the conventional methodology, the results showed that the instructional method (Google Docs) is advantageous and effective in enhancing writing skills. 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 Google Docs.

Keywords: Accuracy; Collaborative writing; Complexity; Fluency; Google Docs; Writing skill

INTRODUCTION

Writing is an important productive skill for learning other receptive and productive abilities in a second language (L2) (Zhu, 2004). Writing increases cognition and learning, encourages communication, and allows for reflection (Mekheimer, 2005). After they've been written down, ideas may be evaluated, reexamined, reorganized, and modified. Olshtain (2001) emphasized the significance of this critical talent, claiming that the skill of writing has exceptional status--it is via writing that a person may ex- press a range of messages to near or distant known or unknown readers. Despite the importance of writing, L2 learners may impede the from strengthening heir writing skills. The difficulty of writing is routinely acknowledged by experts in the area. Ac- cording to Nunan (1989), learning to write often and expressively is the most challenging motor skill for all language users, regardless of whether the language is a first, second, or

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foreign language. As Nunan (1996) points out, producing a cohesive, fluent, and substantial piece of writing is likely the most difficult thing to achieve in a language. Writing, according to Richards and Renandya (2002), is the most difficult ability for L2 learners to acquire.

To help L2 students with this difficult ability, L2 instructors might utilize a range of tools. One alternative is to leverage technology developments and technologies that might be beneficial for educational objectives. Given the prevalence of technical breakthroughs in our everyday lives and the permeation of technology in practically every part of today's life, it seems promising to explore the impact of utilizing Google Docs, as an example of technological resource, on EFL learners' writing growth.

Google Docs, a Web 2.0 application that has the potential to boost the academic writing skills of EFL learners (Ebadi & Rahimi, 2017; Godwin-Jones, 2008), allows users to readily update papers both synchronously and asynchronously. Students may use Google Docs to write and update documents online while collaborating with other students or the instructor in real time (George, 2012). Google Docs incorporation into collaborative writing practices has gotten comparatively little scholarly attention.

This online technological tool has piqued the curiosity of computer-assisted language learning (CALL) experts. According to the sociocultural theory of L2 acquisition (Lantolf, 2000; Lantolf & Appel, 1994), interaction, specifically focusing on language and language use, as well as engaging in collaborative dialogue (Swain, 2000), are essential processes in L2 learning through which students cocreate knowledge about the target language. In fact, the fundamental ideas of this theory are what sparked this interest in collaborative writing using Google Docs. When compared to research on the ad- vantages of collaborative work for speaking, the number of studies evaluating the benefits of collaborative work for writing in L2 is very limited (Storch, 2005; Storch & Wigglesworth, 2007). According to Storch (2005), although pair and group work are common in language courses, relatively few researches have looked into the nature of such cooperation when students create a collaboratively authored document. The bulk of research on collaborative writing in the L2 classroom has focused on learners' attitudes towards group/pair work in general, rather than the practice of collaborative writing specifically.

Collaborative writing was one of Google Docs' most popular applications in education, but it was also utilized for a variety of other purposes. According to Thompson (2008), Google Docs allows users to collaborate on the production and modification of online written materials. Sharp (2009) mirrored this sentiment when he said that Google Docs enabled members of one group to write a document while concurrently observing the modifications that were being made. These characteristics made it possible to update a shared text at the same time. As a consequence, Google Docs was judged to be a more beneficial tool for developing creativity in learning and independence while completing a written work than a regular classroom (Chinnery, 2008).

The first to explore how well Google Docs performed for collaborative writing activities were Zhou, Simpson, and Domizi (2012). The two writing tasks were sent to 35 participants. This research included two groups, one using Google Docs and the other in a more conventional setting. These two tasks were used to assess student performance. Despite the fact that Google Docs was effective for 93% of participants' research, it had no effect on students' grades. Furthermore, despite not having previously utilized Google Docs, student participation on this platform encouraged them to do so in the future.

Ishtaiwa and Aburezeq attempted to explore how Google Docs affects student cooperation in EFL classrooms, as well as any possible barriers to such collaboration, in their 2015research. The study revealed that the unique characteristics of Google Docs improved student engagement. In an EFL context, Sarah and Yu-Ju (2016) identified disparities in motivation, vocabulary development, and perceptions between two different groups. The second group did individual English practice, while the first group used Google Docs to communicate with their peers on language challenges. The collaborative group

outperformed the solo group in terms of performance, learning, and overall experience. According to this research, Google Docs enhanced students' enthusiasm to learn foreign languages.

Ebadi and Rahimi (2017) investigated the influence of online peer editing on academic writing abilities among EFL learners using Google Docs. The participants were chosen from two complete classes of ten EFL students each studying an IELTS course at a language institution in Sanandaj, Iran. IELTS Tasks 1 and 2 were used to evaluate the students' academic writing abilities, and a semi-structured interview was undertaken to learn more about how online peer-editing influenced the students' academic writing skills. The findings showed that both in-person teaching and peer editing using Google Docs significantly improved students' academic writing abilities, with the former outperforming the latter.

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

RQ: *Does Google docs-mediated collaborative writing have a significant effect on Iranian intermediate EFL learners' written complexity, accuracy, and fluency?*

METHOD

Participants

Fifty EFL students from three different language institutes in Shahrekord participated in the research. They were randomly assigned to one of two groups (experimental and control, each with 25 intermediate EFL learners) based on their performance on the Oxford Quick Placement Test (OQPT). The sample included both male and female participants who spoke Persian as their first language; the students ranged in age from 20 to 35 years old.

Procedure

To reflect the community of intermediate English language learners at three language institutions in Shahrekord, Iran, a homogeneous sample of intermediate EFL learners was recruited. The participants were then randomly allocated to a Google Doc Group (GDG) and a control group of 25 learners each. Students in the control and experimental groups were given a cause-and-effect pre-test, and their writing complexity, accuracy, and fluency were assessed using CAF measures. Following the pre-test, participants in the experimental group underwent a six-week treatment phase. To be more precise, students in the experimental groups were taught about Google Docs and how it may be utilized for collaborative writing assignments.

Each GDG member created a Google Doc for oneself and shared it with the other participants. They then revised each other's papers in groups of two using Google Docs while acting in unison (i.e. with a lapse of time). Each time, the entire class had to edit a peer's writing. Using a different font color, the students were instructed to proofread their classmates' writings while looking for crucial elements, such as the organization of the information, the use of linking phrases, the choice of appropriate vocabulary, collocation, prepositions, precise grammar structures and tenses, and punctuation. The phases of the writing process (pre-writing, drafting, and rewriting) were carried out in a face-to-face situation but without cooperation for the control group, using the identical instructional materials. This group's learners all had the same amount of lessons, and only the instructor was in charge of giving feedback. At the end of the intervention, the learners in the two groups were given a writing post-test that was comparable to the writing pre-test, and their CAF scores were compared. After their compositions were graded by two separate raters, the inter-rater reliability coefficients for the writing pre-test and writing post-test were determined.

RESULTS

Table 1 shows the acquired mean score and 5% Trimmed Mean for each group. The table shows that the means for each group and the 5% trimmed mean are not statistically different. It illustrates that the extreme top and bottom 5% of scores had little to no influence on the final mean scores.

Table 1
Test Scores Normality: Descriptive Statistics for Participated Groups

		Statistic	Std. Error
GDG C pre-test	Mean	9.93	.21
	5% Trimmed Mean	9.98	
GDG A pre-test	Mean	7.72	.24
	5% Trimmed Mean	7.80	
GDG F pre-test	Mean	7.37	.24
	5% Trimmed Mean	7.38	
GDG C post-test	Mean	16.52	.28
	5% Trimmed Mean	16.52	
GDG A post-test	Mean	18.82	.23
	5% Trimmed Mean	18.91	
GDG F post-test	Mean	17.27	.27307
	5% Trimmed Mean	17.28	
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	
CG C post-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[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
GDG C pre-test	.206	25	.008	.941	25	.155
GDG A pre-test	.272	25	.000	.849	25	.002
GDG F pre-test	.179	25	.038	.949	25	.234
GDG C post-test	.130	25	.200*	.957	25	.354
GDG A post-test	.240	25	.001	.828	25	.001
GDG F post-test	.193	25	.017	.944	25	.179
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

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 covariance 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. Intermediate EFL learners' written CAF.

Table 5
Descriptive Statistics for the participants in Google Docs and Conventional Groups

Group types	Mean	Std. Deviation	N
Google Doc	16.52	1.44	25
Conventional	14.18	1.41	25
Total	15.35	1.84	50

The Descriptive statistics of the participants in the GDG group (N=25, SD=1.44, M=16.52) and the CG group (N=25, SD=1.41, M=14.18) are shown in Table 5. According to the obtained mean scores, the GD group performed better than the control group in terms of how complex collaborative writing was.

Table 6
Levene's Test of Equality of Error Variances Dependent Variable: Complexity of Collaborative Writing

F	df1	df2	Sig.
.188	1	48	.66

Table 6 demonstrates that the p-value is higher than the alpha level (P=. 66). As a result, there has been no violation of the variances' equality assumption. Table 7 discusses the significance of the obtained difference between mean scores.

Results of the Research Question

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

Does Google doc-mediated collaborative writing have a significant effect on Iranian intermediate EFL learners' written CAF? Google-doc-mediated collaborative writing has no significant effect on Iranian.

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	69.5[a]	2	34.75	16.77	.000	.416
Intercept	142.1	1	142.11	68.59	.000	.593
Covariate (Complexity pre-test)	1.05	1	1.05	.51	.479	.011
Group types	69.45	1	69.4	33.52	.000	.416
Error	97.37	47	2.07			
Total	11948	50				
Corrected Total	166.8	49				

a. R Squared = .416 (Adjusted R Squared = .392)

The obtained difference for the mean scores is meaningful, as shown in Table 7 (P=.000<0.05). Thus, the results show that using Google Docs for the collaborative writing process is effective, and students in the GDG group outperformed those in the CG group. According to Cohen (1988), this case's partial eta-square represents a small effect size of 0.41. The co- variate has a 0.47 significance level. This shows that when the independent variable is controlled for, there is no statistically significant relation- ship between the covariate and

the complexity of the collaborative writing. The covariate's effect is not significant because the p-value is greater than .05. In reality, it accounted for 1% of the variance in the dependent variable. As a result, the 4.7 results obtained showed that there are significant differences between the participants' performances under various treatment scenarios. Additionally, the results revealed a minor covariate intervention (the appreciable difference between the learners' complexity performance in the GDG and CG conditions).

Table 8
Grand Mean
Dependent Variable: Complexity of the Collaborative Writing

95% Confidence Interval			
Mean	**Std. Error**		
		Lower Bound	Upper Bound
15.350a	.204	14.940	15.760

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

Table 9
Descriptive Statistics
Dependent Variable: Accuracy of the Collaborative Writing

Grouping GDGCG	**Mean**	**Std. Deviation**	**N**
Google Doc	18.82	1.18	25
Conventional	14.13	.79	25
Total	16.47	2.57	50

The descriptive statistics of the GDG (N=25, SD=1.18, M=18.82) and CG (N=25, SD=0.79, M=14.13) participants are shown in Table 9. As a result, the GDG group performed better on the accuracy of collaborative writing, according to 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.**
3.47	1	48	.068

The p-value is greater than the alpha level, as shown in Table 10 (P=0.06). As a result, there has been no violation of the variances' equality assumption. The significance of the obtained difference between mean scores is dis- cussed in Table 11.

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

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	276.2[a]	2	138.1	136.5	.000	.85
Intercept	315.5	1	315.5	311.9	.000	.86
Covariate	1.2	1	1.2	1.2	.266	.02
Grouping	233.5	1	233.5	230.8	.000	.83
Error	47.5	47	1.01			
Total	13895.05	50				
Corrected Total	323.7	49				

a. R Squared = .853 (Adjusted R Squared = .847)

The difference found between the mean scores is significant, as shown in Table 11 (P=. 000<0.05). Thus, as the results show, using Google Docs in the process of collaborative writing is effective, and students in the GD group outperformed the CG group. According to Cohen (1988), this case's partial eta-square represents a small effect size of 0.83. The co- variate's significance level is 0.26. As long as the independent variable is taken into account, this suggests that there is no meaningful relationship between the covariate and the accuracy of the collaborative writing. The covariate's effect is not significant because the p-value is higher than .05. In actuality, it accounted for 2% of the variation in the dependent variable. As a result, table 11's obtained results demonstrated that participant performances under various treatment scenarios varied significantly from one another. The findings also revealed a minor covariate intervention (the appreciable difference in accuracy between the learners' performance in the GDG and CG conditions).

Table 12
Grand Mean
Dependent Variable: Accuracy of the Collaborative Writing

95% Confidence Interval			
Mean	**Std. Error**		
		Lower Bound	Upper Bound
16.475[a]	.142	16.189	16.761

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

Grouping	Mean	Std. Deviation	N
Google Doc	17.27	1.36	25
Conventional	14.46	.98	25
Total	15.86	1.84	50

The descriptive statistics of the GDG (N = 25, SD = 1 36, M = 17 27), and CG (N = 25, SD = 0 98, M = 14 46) participants are shown in Table 13. According to the obtained mean scores, the GDG 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.
.025	1	48	.87

The p-value is greater than the alpha level (P=0.87), as shown in Table 14. As a result, the equality of the variances assumption has not been broken. Table 15 will discuss whether or not the obtained difference between mean scores is significant.

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	116.6[a]	2	58.3	54.98	.000	.70
Intercept	377.8	1	377.8	356.2	.000	.88
Covariate	17.9	1	17.9	16.9	.000	.26
Group types	95.7	1	95.7	90.2	.000	.65
Error	49.8	47	1.06			
Total	12751.4	50				
Corrected Total	166.5	49				

a. R Squared = .701 (Adjusted R Squared = .688)

According to Table 15, the obtained difference between the mean scores is significant (P=. 000<0.05). Thus, using Wikis in the process of collaborative writing is effective, and students in the WG group outperformed those in the CG group, according to the results. Ac- cording to Cohen (1988), a small effect size is indicated by the partial eta-square for this case, which is 0.65. The covariate's significant level is 0.000. This suggests that, after adjusting for the independent variable, there is a meaningful relationship between the covariate and the fluency of the collaborative writing. The covariate's impact is noteworthy because the p-value is less than .05. In actuality, it accounted for 26% of the variation in the dependent variable's variance. The obtained results from table 16 thus demonstrated that there are appreciable differences between the participant performances under various treatment scenarios. 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
15.865[a]	.146	15.572	16.158

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

DISCUSSION

Justification for the findings of this research can be found in the traits of writing complexity. Speaking is easier than writing because there are far less constraints on writing. Written texts, which are generally shorter, use longer, more complicated words and sentences. They have more lexical variety, nominalizations, and noun-based sentences. Written texts are more lexically rich than spoken language, according to Fathi and Rahimi (2020), since they contain proportionately more lexical words than grammatical words. Students can produce written texts with observable complexity when they use Google Doc in cooperation with peers to assist them get beyond the difficulties that are traditionally associated with writing complexity.

One observable aspect of Vygotsky's socio- cultural theory that is supported is the structuring of Google Docs. Learners who use Google Docs for writing have been observed to reflect on their own and others' language use, ask for and give clarifications to others, as well as to offer criticism and recommendations. They have also been shown to work together to address linguistic issues by supporting one another (Lee, 2010; Li, 2013, 2014; Nami & Marandi, 2014). In other words, mutuality was observed in the discussion style, which included group writing, in several investigations. They worked closely together, thus their writing would be complicated in the way that proficient language users are expected to be.

The majority of relevant research that has been done in the past has discovered findings that are similar to those of this study. The best feature of Google Docs is peer editing, which improves writing complexity through repetition (Brodahl et al., 2011; Sharp, 2009). Google Docs is a particularly promising tool for peer collaboration and that it enables the learners to engage in useful and genuine learning activities, according to Goold, Coldwell, and Craig (2010), who cited Gralla (2010) and Morales and Collins (2007) in their analysis. Riley-Huff (2010) asserts that the use of Google Docs can considerably and favorably increase group collaboration and hence save time and effort. Additionally, Ishtaiwa and Aburezeq

(2015) assert that Google Docs enhances student-student relationships after studying how using Google Docs affected those interactions. By comparing their work to that of their peers, giving and get- ting criticism on complex writing components, quickly transferring information, etc., the students' learning abilities could be improved.

The process of working together on a project would provide a social learning setting where less proficient peers might encourage more proficient peers while also utilizing their own linguistic abilities. One can contend that the ZPD can be utilized to cooperatively combine the learners' talents, improving the language that is created. Other studies have shown that texts created collaboratively are more accurate than texts written alone. (Wigglesworth & Storch, 2009; Wigglesworth & Storch, 2007; Dobao, 2012; Storch, 1999, 2005). These studies used texts produced under two distinct settings (i.e., both separately and collectively). They discovered that cooperatively authored texts were both more accurate and of greater overall quality when compared to those written independently (well- structured and focused. Storch (2005) investigated both the process and output of collaborative writing as well as students' views toward it. At an Australian university, she gathered data from adult ESL students enrolled in degree programs. Students could write individually or in couples. 18 pupils preferred to work in pairs, compared to 5 who preferred to work alone. She then compared the texts produced by pairs of pupils with those by individual students. She also examined how students observed and evaluated the group writing process. The results showed that pairs were able to create shorter but better texts in terms of goal fulfillment, grammatical accuracy, and structural complexity, which allowed them to perform the assignment more skillfully.

CONCLUSION

Writing is an important part of language acquisition. Due to the time restrictions that characterize in-person courses, restricting writing education to a classroom environment would not result in the proper development of this valuable skill. Language instructors may now include Web 2.0 technologies into their teaching strategies to enhance their pedagogical approaches and their students' writing skills, owing to technological improvements (Kessler et al., 2012). Students may work more effectively with their classmates utilizing Web 2.0 technologies regardless of where they are or when they need to complete an assignment. As a consequence, students have several opportunities to practice writing, which is critical for improving their writing skills.

Google docs is one of several technological tools that may be used to enhance students' writing. The majority of EFL students, regardless of their level of ability, like reading digital texts to develop their language abilities, particularly their writing skills. Because of its mobility, affordability, and ability to be saved on their laptops or mobile devices, learning with digital texts looks to be enjoyable and effective for them. Google docs allow students to check their writing talents for free, making learning more inexpensive. However, there are specific Google docs pages where students may access digital literature for instructional reasons. It is critical for the integration of language acquisition. As previously said, the present research aimed to compare the development of writing abilities among Iranian EFL students using Google docs as a technical tool. The study's goal was to see whether using Google docs instead of traditional teaching tactics had any influence on the writing abilities of EFL students. When compared to traditional methods, the study's results indicated that this tool is fundamentally beneficial and successful at improving writing abilities. The results support the hypothesis that support the use of technology-based techniques in EFL writing instruction. The results back up Zou's (2006) claim that computer technology assists in the development of writing skills and Hyland's (2002) claim that computer-mediated training may increase writing abilities.

This research adds to the body of knowledge in the area of second language acquisition by showing how the usage of Google docs as a platform for collaboration and criticism improves writing quality. This is congruent

with the results of Achterman (2006), who emphasized the Google docs' role to improving the character of student engagement. Lamb (2004) came to similar results, recommending Google docs as a source that is more interesting in the writing process than the completed product. According to the study's deductions and findings, Google docs have tremendously aided individuals in improving their writing abilities by giving possibilities for online critique.

References

Abdel, M., & Farrah. (2015). Online collaborative writing: Students' perception. *Journal of Creative Practices in Language Learning and Teaching, 3*, 17–32.

Abrams, Z. (2016). Exploring collaboratively written L2 texts among first-year learners of German in Google Docs. *Computer Assisted Language Learning, 29*(8), 1259–1270.

Al Ajmi, A., & Ali, H. (2014). Collaborative writing in group assignment in an EFL/ESL classroom. *English Linguistics Research, 3*(2), 1-17.

Arnold, N., Ducate, L., Lomicka, L., & Lord, G. (2009). Assessing online collaboration among language teachers: A cross- institutional case study. *Journal of Interactive Online Learning, 8*(2), 121-139.

Arnold, N., Ducate, L., & Kost, C. (2012). Collaboration or cooperation? Analyzing group dynamics and revision processes in Wikis. *CALICO Journal, 29*(2), 224–248.

Bikowski, D., & Vithanage, R. (2016). Effects of web-based collaborative writing on individual L2 writing development. *Language Learning & Technology, 20*, 79–99.

Brodahl, C., Hadjerrouit, S., & Hansen, N. K. (2011). Collaborative writing with web 2.0 technologies: Education students' perceptions. *Journal of Information Technology Education: Innovations in Practice, 10*, 73–103.

Brodahl C, & Kristian Hansen, N.K. (2014). Education students' use of collaborative writing tools in collectively reflective essay papers. *Journal of Information Technology Education and Research, 13*, 1–30.

Byrad, D. (2010). Framing, reflecting on and attending to a rationale of teaching of writing in the second language classroom via journaling: A case study. *System, 38*, 200-210.

Carmen Helena, G. N. (2007). Applications of Vygotskyan concept of mediation in SLA. Colombian *Applied Linguistics Journal, (9)*, 213–228.

Dabao, A., & Blum, A. (2013). Collaborative writing in pairs and small groups: Learners' attitudes and perceptions. *System, 41*, 365-378.

Dale, H. (1994). Collaborative writing interaction in one ninth-grade classroom. *Journal of Educational Research, 87*(6), 334-344.

Ebadi, S., & Rahimi, M. (2017). Exploring the impact of online peer-editing using Google Docs on EFL learners' academic writing skills: A mixed methods study. *Computer Assisted Language Learning, 30*, 787–815.

Elola, I., & Oskoz, A. (2010). Collaborative writing: Fostering foreign language and writing convention development. *Language Learning & Technology, 14*(3), 51–71.

Fathi, J., & Rahimi, M. (2020). Examining the impact of flipped classroom on writing complexity, accuracy, and fluency: A case of EFL students. *Computer Assisted Language Learning*. https://doi.org/10.1080/09588221.2020.1825097

George, D.R. (2012). Using Google Docs to enhance medical student reflection. *Medical Education, 46*(5), 504–5.

Godwin-Jones, R. (2008). Emerging technologies web-writing 2.0: Enabling, documenting, and assessing writing online. *Language Learning & Technology, 12*, 7–13.

Gralla, P. (2010). Google Docs better: Ready to

take on office. *Computerworld.* Retrieved from http: //www.cio.com.au /article/34 4145/googledocsbetterreadytakeoffice

Gutierrez, A. (2008). Microgenesis, method and object: A study of collaborative activity in Spanish as a foreign language classroom. *Applied Linguistics, 29*(1), 120-148.

Ishtaiwa, F. F., & Aburezeq, I. M. (2015). The impact of Google Docs on student collaboration: A UAE case study. *Learning, Culture and Social Interaction, 7,* 85–96. Kessler, G., Bikowski, D., & Boggs, J. (2012). Collaborative writing among second language learners in academic web-based projects. *Language Learning & Technology, 16*(1), 91– 109.

Lantolf, J., & Thorne, S. (2006). *Sociocultural theory and the genesis of second language development*. Oxford, UK: Oxfod University Press.

Lantolf, J., & Thorne, S. (2007). Sociocultural theory and second language acquisition. In B. V. Patten & J. Williams (Eds.), *Theories in second language acquisition* (pp. 201-224). Mahwah,NJ: Erlbaum.

Lave J. & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. New York, NY: Cambridge University Press

Lincoln, Y., & Guba, E. (1985). Naturalistic inquiry. Beverly Hills, CA: Sage

Liu, S. H. J., & Lan, Y. J. (2016). Social constructivist approach to web-based EFL learning: Collaboration, motivation, and perception on the use of Google Docs. *Educational Technology & Society, 19*(1), 171–186.

Mansor, A. Z. (2012). Google docs as a collaborating tool for academicians. *Procedia - Social and Behavioral Sciences, 59*, 411–419.

Mays, C. (2017). Writing complexity, one stability at a time: Teaching complexity as a complex system. *College Composition and Communication, 68*, 559– 585.

Mutsuda, P. (2003). Process and post-process: A discursive history. *Journal of second language writing, 12*(1), 65-83.

Perron, B. E., & Sellers, J. (2011). Book review: A review of the collaborative and sharing aspects of Google Docs. *Research on Social Work Practice, 21*, 489–490.

Rouhshad, A., & Storch, N. (2016). A focus on mode: Patterns of interaction in face-to-face and computer-mediated contexts. In M. Sato & S. Ballinger (Eds.), *Peer- interaction and second language learning: Pedagogical potential and research agenda* (pp. 267– 290). Philadelphia, PA: John Benja- mins Publishing Company

Sarah Hsueh-Jui, L., & Yu-Ju, L. (2016). Social constructivist approach to web-based EFL learning: Collaboration, motivation, and perception on the use of Google Docs. *Journal of Educational Technology & Society, 19*(1), 171–186.

Schwieter, J. W. (2010). Developing second language writing through scaffolding in the ZPD: A magazine project for an authentic audience. *Journal of College Teaching & Learning, 7*(10), 31–45.

Searle, J. R. (1995). The construction of social reality. London, England: Penguin Books.

Seyyedrezaie, Z. S., Ghonsooly, B., Shahriari, H., & Fatemi, H. H. (2016). A mixed methods analysis of the effect of google docs environment on EFL learners' writing performance and causal attributions for success and failure. *Turkish Online Journal of Distance Education, 17*(3), 90–110.

Shehadeh, A. (2011). Effects and students' perceptions of collaborative writing in L2. *Journal of Second Language Writing, 20*(4), 286-305.

Storch, N. (1999). Are two heads better than one? Pair work and grammatical accuracy. *System, 27*(3), 363-374.

Storch, N. (2001a). Comparing ESL learners' attention to grammar on three different collaborative tasks. *RELC Journal, 32*(2), 104-124.

Storch, N. (2001b). How collaborative is pair work? ESL tertiary students composing in pairs. Language *Research Forum, 5*(1), 29-53.

Storch, N. (2005). Collaborative writing: Product, process, and students' reflections. *Journal of Second Language Writing, 14* (3), 153-173.

Storch, N. (2008). Metatalk in pair work activity: Level of engagement and implications for language development. *Language Awareness, 17* (2), 95-114.

Storch, N. (2011). Collaborative writing in L2 contexts: Processes, outcomes, and future directions. *Annual Review of Applied Linguistics, 31*, 275-288. doi:10.1017/ S0267190511000079.

Storch, N. (2012). Collaborative writing as a site for L2 learning in face-to-face and online modes. In G. Kessler, A. Oskoz & I. Elola (Eds.), *Technology across writing contexts and tasks* (pp. 113-129). Texas: Texas State University.

Storch, N. (2013a). Collaborative Language Learning. In C. Chapelle (Ed.), *The encyclopedia of applied linguistics*. Ox- ford, UK: Wiley-Blackwell publishing.

Storch, N. (2013b). Collaborative writing in L2 classrooms: New perspectives on language and education. Bristol, UK: Multilingual Matters

Storch, N., & Aldosari, A. (2013). Pairing learners in pair work activity. *Language Teaching Research, 17*(1), 31-48.

Storch, N., & Wigglesworth, G. (2010a). Learners' processing, uptake and retention of corrective feedback on writing. Case studies. *Studies in Second Language Acquisition, 32*, 303–334.

Suwantarathip, O., & Wichadee, S. (2014). The effects of collaborative writing activity using Google Docs on students' writing abilities. *Turkish Online Journal of Educational Technology, 13*(2), 148–156.

Swain, M. (2001). Integrating language and content teaching through collaborative tasks. The Canadian *Modern Language Review, 58*(1), 44–63.

Wenyi, Z., Simpson, E., & Domizi, D. P. (2012). Google Docs in an out-of-class collaborative writing activity. *International Journal of Teaching & Learning in Higher Education, 24*(3), 359–375.

Wigglesworth, G., & Storch, N. (2009). Pairs versus individual writing: Effects on fluency, complexity and accuracy. *Language Testing, 26,* 445-466.

Yang, C. R. (2010). Using Google Docs to facilitate collaborative writing in an English language classroom practice. *TeslEj, 14*(3), 1–8.

Yates, N. (2008). Wikis and constructivism: Exploring the links. *The JALT CALL Journal, 4*(3), 15-28.

Zhou, W., Simpson, E., & Domizi, D. P. (2012). Google Docs in an out-of-class collaborative writing activity. *International Journal of Teaching and Learning in Higher Education, 24*(3), 359–375.

Zuengler, J., & Miller, R. (2006). Cognitive and sociocultural perspectives: Two parallel SLA worlds? *TESOL Quarterly, 40*(1), 35-5

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