Disclosing the Effects of Online Collaborative Writing on Writing Skills and Self-Perception of Technology: A Study on Ethiopian EFL Learners

Afsheen Rezai [1], Tribhuwan Kumar [2], Mengesha Robso Wodajo[* 3] (iD)

[1] *Assistant Professor, Teaching English and Linguistics Department, University of Ayatollah Ozma Borujerdi, Borujerd City, Iran*

[2] *Assistant Professor of English, Department of English Language and Literature, College of Science and Humanities at Sulail, Prince Sattam Bin Abdulaziz University, Al Kharj, Saudi Arabia*

[3] *Senior Lecturer at Department of History, Bule Hora University, Bule Hora, Ethiopia*

Abstract: The integration of technology in second language education has made online collaborative writing (OCW) a valuable method for enhancing writing skills. Despite this, its effects on writing skills and technological self-perception in Ethiopia have not been thoroughly explored. This study aims to fill this gap by assessing the impact of OCW, through the use of Wiki and Telegram applications, on writing skills and technological self-perception within Ethiopia's English as a Foreign Language (EFL) setting. Forty-five intermediate IELTS candidates from a language school in Utopia were randomly divided into three groups: the Wiki group (n = 15), the Telegram group (n = 15), and a control group (n = 15). They participated in pre-tests, interventions, post-tests, and completed a technology self-perception survey both before and after the intervention. The one-way ANOVA results showed that the Wiki and Telegram groups outperformed the control group in post-test writing skills. However, no significant difference was found between the Wiki and Telegram groups' post-test writing skills. Moreover, both groups reported a more positive view of technology following the intervention. These outcomes hold significant implications for EFL stakeholders in Ethiopia and pave the way for further research.

Keywords: Online Collaborative Writing; Self-perception of Technology; Writing Skills; EFL Learners.

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[*] **Corresponding Author.**

Authors' Email Address:
[1] **Afsheen Rezai** (afsheen.rezai@abru.ac.ir), [2] **Tribhuwan Kumar** (t.kumar@psau.edu.sa),
[3] **Mengesha Robso Wodajo** (mengewaja@gmail.com

Introduction

Writing skills (WSs) are pivotal in the context of learning English as a Foreign Language (EFL) in Ethiopia (Gashaye & Muchie, 2021; Mohammadi et al., 2018). With the escalating importance of English for global communication and economic growth, proficient writing in English emerges as a critical competency for Ethiopian EFL learners (Mohamed & Abdellatif, 2023; Sharma, 2013). Beyond bolstering self-expression, robust WSs are instrumental in fostering academic achievement and opening doors to future career opportunities (Rezai et al., 2022). This issue is more evident in online learning environments.

Recent years have seen a surge in interest in online EFL learning. Online platforms offer EFL students the convenience of accessing materials and classes at any time and place, enriching their educational experience and enabling them to achieve outcomes comparable to traditional classroom settings (Azizi, 2022). With the growing integration of technology in education, teachers are increasingly expected to incorporate digital tools to augment in-class instruction (Azizi & Rezai, 2021). A prominent topic in educational technology today is the use of the Internet and online courses for English language acquisition. Furthermore, the use of English writing apps on mobile devices has become more prevalent in language courses, adding excitement and interactivity to the learning process, which in turn fosters greater student engagement (Biglari et al., 2021).

The advent of new technologies has transformed the development of writing skills (WSs) among language learners (Rezai et al., 2022). Digital tools and online platforms have greatly influenced second-language writing by providing new opportunities for collaboration and self-expression (Azizi & Rezai, 2022). Li (2023) suggests that these technological advances have created new possibilities for English as a Foreign Language (EFL) learners to participate in online collaborative writing (OCW). OCW is a method that leverages technology and online platforms to foster effective writing habits (Manegre et al., 2023).

It involves multiple individuals working together on a writing task through internet-based platforms like Google Docs, wikis, or online forums. This approach enables learners to interact, collaborate, and receive real-time feedback from peers, thus overcoming geographical limitations and enriching the writing process.

The literature review indicates a gap in research regarding the impact of OCW on the writing performance of Ethiopian EFL learners. It is crucial to determine whether OCW can significantly enhance the writing skills (WSs) of these learners. This study seeks to illuminate the potential of OCW to improve WSs and positively affect students' technology perceptions within Ethiopia's EFL context. The findings could offer invaluable insights for teachers,

policymakers, and curriculum designers in Ethiopia, enabling them to make well-informed choices about incorporating OCW into the educational framework. Grasping the implications of OCW will assist EFL teachers in crafting and executing teaching strategies that utilize technology to bolster students' WSs. Such knowledge will inform the creation of curricular content, teaching methods, and evaluation techniques that integrate OCW, aiming to advance WSs and students' technological outlook. Demonstrating OCW's advantages, this research may inspire EFL teachers to embrace and tailor these methods in their teaching, thus fostering a deeper connection between students, technology, and WSs.

Review of Literature

Online Collaborative Learning

Giroud (1999) defines collaborative writing as the process where students work together in small groups to collectively create and compose a written piece. Each student actively participates and takes on the responsibility of completing the writing task by exchanging thoughts, plans, and suggestions with their peers. They also collaborate to overcome any challenges that may arise during the writing process (Manegre et al., 2023; Nykopp et al., 2019). Additionally, Erkens et al. (2005) highlight the importance of interdependence among collaborative writers, as they rely on one another for information, resources, tools, and a cooperative mindset in order to achieve their shared goals.

Online collaborative learning involves second language (L2) learners learning and working together in a virtual setting, utilizing various online platforms like discussion forums, chat rooms, and collaborative writing tools (Storch, 2011). Collaborative writing within online environments offers numerous advantages, such as equal participation regardless of time and location differences (Fitria et al., 2023; Parker & Chao, 2007), a means for peer reviewing (Alexander, 2006), the ability to create documents by incorporating information from different sources (Murugesan, 2007), the use of flexible information sharing and commenting tools during the writing process (Parker & Chao, 2007), and the opportunity for L2 teachers to promptly and extensively monitor and provide feedback on L2 learners' writing progress (Li & Zhang, 2023).

Online collaborative learning offers several benefits for L2 learners' WSs. Firstly, it provides increased engagement and motivation compared to traditional classroom settings (Storch, 2011). In a traditional classroom, L2 learners have limited opportunities to actively write and receive feedback. However, OCW allows students to continuously practice writing

and receive real-time feedback from their peers, which boosts their motivation to improve their WSs. This engagement creates a student-centered learning environment, where L2 learners take ownership of their writing and actively strive for improvement (Abe, 2020; Manegre et al., 2023). Additionally, OCW exposes L2 learners to a wide range of perspectives and ideas. Through interaction with their peers, they can enhance their critical thinking skills and gain a deeper understanding of different cultural contexts and language usage. This exposure to diverse perspectives not only enhances their WSs but also broadens their cultural awareness and intercultural communication competency (López-Pellisa et al., 2021). Moreover, OCW excels at providing timely and constructive feedback, which is a key advantage. In traditional classroom settings, L2 learners often face challenges in receiving feedback on their writing due to limited time and resources. However, the benefit of OCW lies in the fact that L2 learners can obtain feedback from multiple peers who offer diverse insights and suggestions for improvement. This iterative feedback process enables L2 learners to revise and refine their writing based on their peers' specific assessments, leading to substantial enhancements in their WSs over time (Tian & Zhou, 2020). Finally, online collaborative learning fosters a vibrant community of practice, where students actively engage in discussions and share knowledge about writing strategies, language usage, and grammar rules. This collaborative environment effectively cultivates a sense of belonging and academic support.

Benefits aside, OCW can be seen as challenging and demanding for students because of potential problems like the uneven distribution of tasks, variations in the amount or quality of contributions from participants, and superficial understanding of information (Lipponen et al., 2003; Nykopp et al., 2019; Salovaara & Järvelä, 2003). Moreover, OCW may not provide immediate feedback, which is usually present in face-to-face writing sessions (Li, 2023). This is because online writers cannot observe nonverbal cues like facial expressions and gestures, which are often helpful for interaction in person. As a result, the lack of these nonverbal signals may impede collaboration in an online setting (Kreijns et al., 2003). The effectiveness of OCW L2 learners in improving their WSs lies in its capability to improve student involvement, provide a range of viewpoints, give prompt feedback, and foster a community for practicing.

Effects of OCW on L2 Writing Skills

A mass of studies has explored the effects of COW on fostering L2 WSs in different countries. To lay the ground for the present study, we crucially review some of them. For example, Limbu and Markauskaite (2015) explored how Australian university students experienced OCW tasks and environments. The authors identified four qualitatively different conceptions of OCW: (a)

an individual process within a social context, (b) a social process with individual accountability, (c) a negotiated process of meaning-making, and (d) a participatory process of knowledge building. Besides, Vorobel and Kim (2017) explored adolescent ELLs' collaborative writing practices in face-to-face and online contexts from an ecological perspective, focusing on adolescent ELLs' perceptions of collaborative writing and their development of writing through collaboration in the USA. Their findings revealed both benefits and challenges adolescent ELLs face during collaborative writing activities, such as increased motivation, peer support, feedback quality, and language development, as well as technical difficulties, unequal participation, and conflicting opinions. Moreover, Bailey and Judd (2018) compared the effects of OCW and TOEIC writing test preparation on the L2 writing performance of South Korean university students. Their results showed that both OCW and TOEIC writing training improved the students' writing performance, but OCW had a greater impact on lexical variation and syntactic complexity, while TOEIC writing training had a greater impact on writing accuracy.

Likewise, Nykopp et al. (2019) looked into how university students coordinated their collaborative online writing and what kinds of coordination profiles were found among the students. The authors identified four distinct coordination profiles by K-means cluster analysis. The study also found that technical problems had a negative impact on essay quality. Plus, Ardiasih and Rasyid (2019) explored the effectiveness of OCW using Wiki to enhance learners' essay WSs in Indonesia. The results evidenced that OCWT using Wiki integrated into Moodle had a significant influence on improving the learners' WSs, especially in terms of lexical variation and syntactic complexity. Furthermore, Such (2021) investigated how scaffolding strategies can support English language learners in OCW activities using wikis in the USA. The results revealed that scaffolding strategies, such as modeling, coaching, articulation, reflection, and exploration, helped the ELLs to improve their WSs, language proficiency, and collaborative behaviors.

Additionally, Li (2023) evaluated the effectiveness of OCW using Tencent Docs, an online platform, on the writing performance, writing self-efficacy, and writing motivation of EFL learners in China. The results documented that the experimental group improved significantly more than the control group in writing performance, motivation, and self-efficacy. In addition, Zhang and Liu (2023) scrutinized the effects of synchronous and asynchronous OCW on the writing performance and attitudes of Chinese language learners. They found that both synchronous and asynchronous OCW improved the students' writing performance

significantly more than individual writing, but there was no significant difference between the two modes. The study also found that the students had positive attitudes toward OCW, but they preferred synchronous mode over asynchronous mode for its immediacy, interactivity, and efficiency. Finally, the study by Ebadijalal and Moradkhani (2023) examined the effects of collaborative writing, collaborative prewriting, and individual writing. The findings uncovered that in collaborative writing, collaborative prewriting groups outperformed the individual writing group in terms of writing quality, fluency, accuracy, and complexity.

The literature reviewed indicates a notable gap in research concerning the impact of OCW via Wiki and Telegram Apps on the WSs and self-perception of technology of EFL learners in Ethiopia. Addressing this gap, the current study investigates whether OCW through these platforms can substantially enhance WSs and self-perception of technology within this context. Accordingly, the study poses the following research questions (RQs):

RQ1: Does OCW through Wiki and Telegram Apps foster Ethiopian EFL learners' WSs?

RQ2: Does OCW through Wiki and Telegram Apps shape positive self-perception of technology in Ethiopian EFL learners?

Methods

Context of the Study

Ethiopia's rich linguistic diversity is home to a substantial number of EFL learners. WSs are vital for these learners to communicate effectively in English in academic and professional contexts. Traditional classrooms may not always offer adequate practice opportunities for developing WSs. OCW platforms like Wiki and the Telegram app provide EFL learners with chances to participate in collaborative writing, receive peer feedback, and access extensive resources to enhance their WSs. Despite OCW's apparent advantages, research on its effectiveness in Ethiopia is scarce. This study seeks to address this research void by examining the impact of Wiki and Telegram app usage on the WSs of Ethiopian EFL learners.

Participants

This study involved 100 adult EFL learners from a randomly selected private language institution in Utopia, out of sixty-three active institutions. The cohort was exclusively female,

thus controlling for gender variation. These participants were intermediate-level IELTS candidates, aged between 22 and 35 (M = 29.21, SD = 7.12), with no English language learning opportunities outside the classroom. They provided verbal consent, which was audio-recorded by the authors. The participants had the freedom to withdraw from the study at any time, and were briefed on the study's final outcomes. Notably, the authors standardized the participant group using the Oxford Placement Test (OPT), choosing those with scores near the mean for allocation into two experimental groups and one control group. Throughout the study, measures were taken to maintain the anonymity and confidentiality of the EFL learners' performance data.

Instruments

The authors deployed some instruments to gather the data. These instruments are detailed below.

Oxford Placement Test

OPT Version 1.1, developed by Oxford University Press and the Cambridge University Local Examinations, is a computer-adaptive assessment that efficiently gauges students' English proficiency. Comprising two sections- Use of English and Listening- the OPT evaluates grammar and vocabulary knowledge, as well as general listening skills. Its adaptive nature ensures question difficulty is tailored to the respondent's level, enhancing the test's precision and dependability over conventional methods. The OPT presents a total of 60 questions, evenly divided between the two sections. Completion time varies from 50 to 90 minutes, contingent on the test-taker's proficiency. Automated scoring provides immediate results, including a Common European Framework of Reference (CEFR) level ranging from Pre-A1 to C2, a score up to 120, and the duration taken. Administered to affirm participant homogeneity in language skills, the OPT's reliability was confirmed with a Cronbach's Alpha coefficient of 0.93 after testing 25 EFL learners analogous to the main study's participants. Additionally, two EFL teachers verified the test's face and content validity, ensuring its comprehensive legitimacy.

Self-perception of Writing Questionnaire

The Writer Self-Perception Scale (WSPS) is a tool designed to evaluate students' self-assessment of their writing capabilities. Grounded in self-efficacy theory, the WSPS was introduced by Bottomley et al. (1997) to explore the affective aspects of students' writing. The

scale comprises five dimensions. The first dimension is *progress* which assesses students' perceptions of their writing improvement over time, with statements like "I write better now than I did previously". The second dimension is *observational comparison* in which students evaluate their writing against their peers', often with a positive self-view, exemplified by "My writing surpasses that of most of my classmates". *Social feedback* is the third dimension which measures the importance students place on receiving writing feedback from teachers, parents, or peers, as indicated by "I appreciate receiving opinions about my writing". The fourth dimension is *physiological states* that captures the emotional and physical responses associated with writing, ranging from enjoyment to anxiety, reflected in statements such as "Writing makes me feel good". The last dimension is *general perception* which gauges the overall confidence and contentment students have regarding their writing skills, with affirmations like "I consider myself a proficient writer". The WSPS includes 33 items rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

To establish the scale's reliability, the authors administered it to 25 EFL learners, yielding a Cronbach's Alpha coefficient of 0.87. Additionally, two university professors in Applied Linguistics validated the scale's face and content validity, endorsing its adequacy. The WSPS was administered as a pre-test before the intervention and as a post-test three months post-intervention to gauge its effectiveness.

IELTS Writing Pre- and Post-test

Two writing tests were employed to measure the participants' WSs before and after the interventions. The tests consisted of IELTS writing tasks 1. ELTS writing task 1 is a part of the IELTS writing test that requires the IELTS candidates to write a summary of at least 150 words based on some visual information, such as graphs, tables, charts, or diagrams. They need to identify and report the main features of the given data and make comparisons or contrasts where relevant. They should write in a formal academic style, using appropriate vocabulary and grammar and organize their responses into clear paragraphs, with an introduction and an overview. It takes 20 minutes to complete this task. The participants' WSs were assessed using some criteria. Task achievement assesses how well the response fulfills the requirements of the task, such as selecting and presenting key features, providing sufficient detail, reporting data accurately, and using an appropriate format and tone. Coherence and cohesion measure how well the response is organized and connected, such as using logical sequencing, clear paragraphing, cohesive devices, and reference words. Lexical resource refers to the range and accuracy of vocabulary used in the response, such as using uncommon or idiomatic words,

collocations, spelling, and word formation. Grammatical range and accuracy assess the range and accuracy of grammatical structures used in the response, such as using complex sentences, punctuation, and error-free sentences. Two professional IELTS examiners conducted the evaluations to ensure inter-rater reliability. This rigorous approach guarantees a consistent and objective assessment of the participants' writing competencies.

Instructional Materials

The instructional material used in the interventions was "Writing for IELTS" by Williams (2012). The book consisted of twelve lessons covering important topics as a supplementary WSs course for IELTS candidates. The rationale behind using this book was its frequent inclusion in IELTS preparation courses and its provision of examination strategies guiding students on what to expect and how to succeed in the test (Williams, 2012).

Data Collection Procedures

To gather the required data, the authors took the following steps. First, they homogenized participants using the OPT. Next, they administered the IELT writing proficiency test and WSPS as the pre-test. Then, they implemented the interventions, consisting of 13 one-hour sessions held once a week.

For the Wiki group, the treatment entailed some important issues. First, the instructor created a Wiki account for each student in the Wiki group and assigned them a username and a password. She also created a Wiki page for each essay topic that the students would write on. She used any Wiki platform that suited their needs, such as [Wikispaces], [MediaWiki], or [PBworks]. Second, she introduced the students to the Wiki environment and explained the purpose and the procedures of OCW. She used some tutorials or videos to demonstrate how to use the Wiki features, such as editing, commenting, linking, and tracking changes. She also showed some examples of collaborative writing projects done by other students or teachers. Third, she divided the students into small groups of 3 or 4 and assigned them a specific role for each essay. For example, one student could be the writer, who was responsible for drafting the essay; another student could be the editor, who was responsible for revising and proofreading the essay; and another student could be the reviewer, who was responsible for providing feedback and suggestions to the writer and the editor. She rotated the roles for each essay so that every student could experience different aspects of collaborative writing. Fourth, she monitored and facilitated the students' OCW process. He used the Wiki tools to track the

students' progress, contributions, and interactions. She also provided guidance, feedback, and encouragement to the students as needed. Further, she created some rubrics or checklists to help the students evaluate their own and their peers' work. In the end, she collected and analyzed the data from the Wiki pages. She used some software or tools to extract and organize the data, such as [WikiExtractor], [WikiStats], or [WikiMetrics].

She also used some qualitative methods to interpret and understand the data, such as coding, categorizing, and thematic analysis. It is important to note that the last three steps were followed for each session where the participants worked on a topic.

To implement the treatment for the Telegram group, some steps for the 13 one-hour sessions were followed. In session one, the instructor introduced the students to the purpose and goals of the study and familiarized them with the Telegram App and its features. She also explained the collaborative writing process and its benefits. From sessions 2-12, the instructor assigned a writing prompt/topic for each session. Then, she divided the participants into smaller teams of 3-4 participants. After that, she encouraged the group members to brainstorm and discuss ideas within their teams through the Telegram App. She allocated around 30 minutes for collaborative writing on the assigned prompt. During this phase, she encouraged the participants to actively engage in the discussion and share their ideas using textual messages, voice notes, or video calls, depending on their preferences. The instructor emphasized the importance of constructive feedback and encouraged the participants to provide suggestions and comments on each other's writing. She monitored the group's interaction and provided guidance if needed, ensuring that the discussions stayed focused on the writing prompt and relevant language aspects. In the last part of each session, she allocated the remaining time for the group members to individually review and revise their collaborative writing based on the feedback received. Particularly, she spurred the participants to reflect on the collaboration experience and note down any insights or challenges they faced during the session. In session 13, the instructor recapped the overall experience and progress made during the preceding sessions and conducted a feedback session with the experimental group members to gather their insights on the effectiveness of the treatment. It is noteworthy that throughout the treatment period, the instructor kept track of the participants' progress, including their initial and final writing samples, to evaluate the improvement in their WSs. She maintained regular communication with the experimental group to address any concerns or issues that may arise during the intervention.

In the control group, participants received the intervention through traditional face-to-face instruction. In each session, the instructor presented a writing topic and asked the students

to write individually on it. The instructor gave direct feedback whenever the students made errors. After the intervention period, the authors administered the IELT writing test and WSPS as post-test measures.

Data Analysis Procedures

The data analysis was conducted using SPSS 23 software. Initially, One-sample Kolmogorov-Smirnov tests were performed to verify the normal distribution of the EFL learners' placement test scores. Subsequently, a series of one-way ANOVA was carried out to compare the mean scores of the experimental and control groups on the proficiency tests, IELTS writing pre- and post-tests, and self-perception questionnaire results. Finally, post-hoc Sheffe analysis was conducted to identify any significant differences among the three groups.

Results

Results of the First Research Question

The first research question focused on whether OCW through Wiki and Telegram Apps enhanced Ethiopian EFL learners' WSs. To investigate this, a one-way ANOVA test was conducted following verification of necessary assumptions. The results of the Kolmogorov-Smirnov test indicated that the collected data met the criteria for a normal distribution, with a p-value of 0.17 surpassing the significance level of 0.05. Levene's test further verified that the assumption of equal variances was satisfied, showing an F value of 6.23 and a p-value of 0.21, both above 0.05. Furthermore, the assumption of independent observations was confirmed as no participant attended more than one class. With these conditions met, the authors proceeded with the one-way ANOVA analysis, and detailed descriptive statistics are presented in Table 1.

Table 1. Descriptive Statistics for IELTS Writing Pre-Test

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Wiki Group	15	12.1333	1.30201	.33618	11.4123	12.8544
Telegram Group	15	11.7333	1.75119	.45216	10.7636	12.7031
Control Group	15	12.6000	1.72378	.44508	11.6454	13.5546
Total	45	12.1556	1.60900	.23986	11.6722	12.6390

The results presented in Table 1 show that the Wiki group had an M of 12.13 and a SD of 1.30. The Telegram group had an M of 11.73 and an SD of 1.75, while the control group had an M of 12.60 and an SD of 1.72. Though there were no significant differences in the means among the groups, the authors conducted a one-way ANOVA to ascertain if the differences were statistically significant. The findings of this analysis are detailed in Table 2.

Table 2. One-Way ANOVA for IELTS Writing Pre-Test

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	5.644	2	2.822	1.095	.344
Within Groups	108.267	42	2.578		
Total	113.911	44			

The writing scores of the three groups on the pre-test did not exhibit any significant differences, as depicted by the results presented in Table 2 (F (2, 42) = 1.095, p > 001). Following this, the authors performed another one-way ANOVA to assess the impact of the interventions on the students' WS scores on the post-test. The descriptive statistics are provided in Table 3 to elucidate the findings.

Table 3. Descriptive Statistics for IELTS Writing Post-Test

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Wiki Group	15	17.6667	2.02367	.52251	16.5460	18.7873
Telegram Group	15	17.9333	1.48645	.38380	17.1102	18.7565
Control Group	15	13.4667	1.76743	.45635	12.4879	14.4454
Total	45	16.3556	2.69811	.40221	15.5450	17.1662

The M and SD values for three distinct groups, namely the Wiki group (M = 17.66, SD = 2.02), the Telegram group (M = 17.93, SD = 1.48), and the control group (M = 13.46, SD = 1.76), are presented in Table 3. It is evident that there are significant differences in the means among these groups. To assess the statistical significance of these differences, a one-way ANOVA was conducted. Table 4 provides the results of this analysis.

Table 4. One-Way ANOVA for IELTS Writing Post-Test

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	188.311	2	94.156	29.959	.000
Within Groups	132.000	42	3.143		
Total	320.311	44			

As indicated in Table 4, there was a significant difference in the post-test scores among the groups. Specifically, both the Wiki group and the Telegram group achieved higher scores on the post-test compared to the other groups (F (2, 42) = 29.959, p = .001). To further understand the specific areas where these differences occurred, the authors conducted a Tukey Test, which can be found in Table 5.

Table 5. Multiple Comparisons for IELTS Writing Post-Test

					Dependent Variable: Scores		
		(I) Post Writing		(J) Post Writing	Mean Difference (I-J)	Std. Error	Sig.
Scheffe	dimension2	Wiki Group	dimension3	Telegram Group	-.26667	.64734	.919
				Control Group	4.20000*	.64734	.000
		Telegram Group	dimension3	Wiki Group	.26667	.64734	.919
				Control Group	4.46667*	.64734	.000
		Control Group	dimension3	Wiki	-4.20000*	.64734	.000
				Telegram Group	-4.46667*	.64734	.000

* The mean difference is significant at the 0.05 level.

Based on the results presented in Table 5, the authors noted a significant difference between the Wiki group and the control group. This distinction was evident through the Sig (p = .00) value, which fell below the set significance level of 0.05. Likewise, a notable difference was also observed between the Telegram group and the control group. These findings suggest that both experimental groups exhibited better performance in terms of enhancing WSs on the post-test when compared to the control group.

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Results of the Second Research Question

The second research question examined whether OCW through Wiki and Telegram Apps influenced the positive self-perception of technology in Ethiopian EFL learners. To investigate this, a one-way ANOVA was performed. The detailed results of the descriptive statistics can be found in Table 6.

Table 6. Descriptive Statistics for Self-Perception of Technology Pre-Test

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Wiki Group	15	39.3333	6.10230	1.57561	35.9540	42.7127
Telegram Group	15	39.6000	8.02496	2.07204	35.1559	44.0441
Control Group	15	42.0000	13.21795	3.41286	34.6801	49.3199
Total	45	40.3111	9.45521	1.40950	37.4705	43.1518

The mean M and SD values of three groups, namely the Wiki group (M = 39.33, SD = 6.10), the Telegram group (M = 39.60, SD = 8.02), and the control group (M = 42.00, SD = 13.21), are presented in Table 6. The findings suggest that there are no significant differences in the Ms among the groups. Consequently, a one-way ANOVA was conducted to evaluate the statistical significance of these variances. The outcomes of this analysis are detailed in Table 7.

Table 7. One-Way ANOVA for Self-Perception of Technology Pre-Test

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	64.711	2	32.356	.351	.706
Within Groups	3868.933	42	92.117		
Total	3933.644	44			

The results shown in Table 7 suggest that there were no significant differences among the three groups in terms of improvements in writing scores at the initial assessment. Subsequently, the authors conducted a one-way ANOVA to examine the impact of the interventions on students' reading comprehension scores in the subsequent examination. Specific descriptive statistics are provided in Table 8.

Table 8. Descriptive Statistics for Self-Perception of Technology Post-Test

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Wiki Group	15	68.9333	8.35350	2.15686	64.3073	73.5593
Telegram Group	15	72.2667	11.67088	3.01341	65.8035	78.7298
Control Group	15	39.7333	11.46091	2.95919	33.3865	46.0802
Total	45	60.3111	18.04895	2.69058	54.8886	65.7336

The M and SD values for three groups, namely the Wiki group (M = 68.93, SD = 8.35), the Telegram group (M = 72.26, SD = 11.67), and the control group (M = 39.73, SD = 11.46), are provided in Table 8. It is evident that there are significant differences in the mean values among the groups. As a result, another one-way ANOVA was conducted to determine the statistical significance of these differences. The results of this analysis can be found in Table 9.

Table 9. One-Way ANOVA for Self-Perception of Technology Post-Test

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	9610.844	2	4805.422	42.735	.000
Within Groups	4722.800	42	112.448		
Total	14333.644	44			

The findings shown in Table 9 indicate significant variations among the three groups concerning their perception of technology on the post-test: F (2, 42) = 42.73, p < .001. To further explore the specific aspects of these variances, the authors conducted a Tukey Test whose results are presented in Table 10.

Table 10. Multiple Comparisons for Self-Perception of Technology Post-Test

Dependent Variable: Score				
(I) Post SELF Perception	(J) Post Self Perception	Mean Difference (I-J)	Std. Error	Sig.

Scheffe	Dimension 2	Wiki Group	dimension3	Telegram Group	-3.33333	3.87208	.693
				Control Group	29.20000*	3.87208	.000
		Telegram Group	dimension3	Wiki Group	3.33333	3.87208	.693
				Control Group	32.53333*	3.87208	.000
		Control Group	dimension3	Wiki Group	-29.20000*	3.87208	.000
				Telegram Group	-32.53333*	3.87208	.000

* The mean difference is significant at the 0.05 level.

Based on Table 10, the authors found a significant difference between the Wiki group and the control group in terms of the improvement in self-perception of technology. This was evident from the obtained Sig (p = .00), which was lower than the significance level (0.05). Similarly, there was a significant difference between the Telegram group and the control group regarding the improvement in self-perception of technology. This suggests that both experimental groups outperformed the control group in terms of the improvement in WSs on the post-test.

Discussion

This study explored the impact of OCW delivered via Wiki and Telegram applications on enhancing EFL learners' WSs and their self-assessment of its efficacy in Ethiopia. The research revealed that OCW significantly bolstered the WSs of Ethiopian EFL students. Specifically, those learners who received instruction through Wiki and Telegram, grounded in OCW's methodologies, demonstrated superior progress in WSs compared to the control group. Furthermore, the experimental groups reported a more favorable view of OCW's effectiveness when accessed through these apps. The results suggest that regardless of the digital platform, Wiki or Telegram, OCW is beneficial in developing EFL learners' WSs and fostering a positive outlook toward their learning experience.

The outcomes of this investigation align with Ardiasih and Rasyid's (2019) research, which highlighted that OCWT via Wiki, integrated with Moodle, markedly improved EFL learners' WSs, notably in lexical diversity and syntactic intricacy. Additionally, this study corroborates Li's (2023) findings, demonstrating that OCW facilitated through Tencent Docs

significantly bolstered Chinese EFL students' writing proficiency, self-efficacy, and motivation. Echoing these results, Zhang and Liu (2023) discovered that both synchronous and asynchronous OCW formats substantially enhanced students' writing performance compared to solitary writing endeavors. Moreover, the participants exhibited favorable perceptions of OCW. Consistent with these observations, Ebadijalal and Moradkhani (2023) reported that in a collaborative writing context, groups engaging in joint prewriting activities surpassed those writing independently in terms of quality, fluency, precision, and complexity.

A potential explanation for these results could be attributed to the notion that OCW via Wiki and Telegram Apps may provide increased practice opportunities. The data suggests that OCW enables EFL learners to participate more frequently in writing exercises (Fredrickson, 2015). Such regular practice likely permits learners to explore diverse writing approaches, benefit from peer feedback, and progressively improve their WSs (Guasch et al., 2013; Zhang & Liu, 2023). Additionally, the use of OCW through these apps may offer valuable collaborative opportunities, as learners can work together and exchange feedback (Li, 2018). This cooperative aspect could foster a supportive and dynamic writing environment, where learners collectively discuss and enhance their WSs (Ebadijalal & Moradkhani, 2023). Another factor contributing to the study's outcomes could be the reduction of anxiety. The findings imply that, in contrast to the stress associated with conventional writing tasks experienced by the control group, OCW via Wiki and Telegram Apps may create a more relaxed atmosphere, encouraging learners to freely express their ideas and creativity with less pressure (Ardiasih & Rasyid, 2019). This decrease in anxiety may lead to a more conducive learning environment, potentially improving the EFL learners' WSs.

In addition, it can be posited that OCW facilitated through Wiki and Telegram Apps may have bolstered motivation and engagement among EFL learners (Abe, 2020). The OCW activities, potentially more stimulating than conventional writing tasks, leveraged the interactive features of these online platforms, such as instant messaging, real-time editing, and group brainstorming to inspire active participation in the writing process (Storch, 2011). This heightened engagement is likely to have translated into improved writing outcomes. Furthermore, the results suggest that OCW provided learners with the chance to engage with a diverse array of peers, exposing them to a multitude of writing styles and viewpoints (Hsieh, 2020). Such exposure could expand the learners' grasp of various writing techniques and norms (Such, 2021), enabling them to situate their writing skills within a global framework and embrace novel methods to refine their writing.

The enhanced self-perception of EFL learners regarding OCW via Wiki and Telegram Apps may be attributed to heightened social interaction. The study suggests that OCW on these platforms facilitates peer engagement (Manegre et al., 2023; Storch, 2013), fostering a learning community. Additionally, the favorable view of OCW among the Ethiopian EFL learners could arise from the social bonds formed, enabling idea exchange, mutual support, and exposure to diverse perspectives (Bailey & Judd, 2018). Another contributing factor could be the increased autonomy afforded by OCW through these apps, allowing the EFL learners to select topics, collaborate, and manage writing tasks independently (Fan & Xu, 2020), thereby boosting their confidence and self-perception. Lastly, the study's findings may highlight the flexibility and convenience of OCW, offering learners the ability to practice writing anytime and anywhere with internet access (Nykopp et al., 2019), which could lead to a more integrated and enjoyable learning experience.

Conclusions and Pedagogical Implications

This research examined the influence of OCW delivered through Wiki and Telegram Apps on enhancing the WSs of EFL learners in Ethiopia, as well as their self-perception of its effectiveness. The study's results indicated that OCW positively contributed to the improvement of WSs among Ethiopian EFL students. Furthermore, the experimental groups reported a favorable self-perception regarding the use of OCW via Wiki and Telegram Apps. In summary, the findings highlighted the beneficial impact of OCW platforms, including Wiki and Telegram Apps, on the WSs and self-perception of EFL learners.

Reflecting on the study's outcomes, several pedagogical implications emerge for educational policymakers, teacher educators, EFL teachers, and learners. Firstly, policymakers should integrate OCW tools like Wiki and Telegram Apps into educational programs to bolster EFL learners' WSs and foster collaborative learning. Additionally, ensuring access to digital resources in educational settings is crucial for facilitating OCW engagement. Secondly, teacher educators must offer professional development to improve EFL teachers' adeptness with OCW, focusing on effective platform utilization for collaborative writing and feedback provision. Thirdly, EFL teachers should embrace a learner-centric approach, encouraging collaboration and peer feedback through OCW, and leverage its features for consistent, constructive feedback. Teachers should also promote self-reflection among learners using OCW, enabling them to track progress and set personal goals, thus enhancing self-perception and ownership of their writing journey. Finally, EFL learners should be motivated to participate in online writing

communities, interact with native speakers, and share feedback, thereby refining their WSs and gaining authentic language exposure.

Considering the constraints of this study, several avenues for future research are proposed. Firstly, a longitudinal follow-up study is necessary to assess whether the positive outcomes noted in the current research persist over time, offering insight into the long-term enhancement of EFL learners' WSs and self-perception. Secondly, the efficacy of alternative OCW platforms like Google Docs or Microsoft Office 365 should be compared with Wiki and Telegram Apps to ascertain if the benefits observed are platform-specific or universally attainable with various tools. Thirdly, further investigation is warranted to evaluate the impact of OCW in diverse educational settings, encompassing different academic levels and English proficiency stages, to understand its potential advantages for a wide spectrum of EFL learners. Fourthly, the research scope could be broadened to explore OCW's effects on other linguistic abilities, such as speaking or listening, thus gaining a holistic view of its benefits for language acquisition. Finally, subsequent studies might investigate the role of cultural dynamics in OCW's effectiveness, examining how cultural values, norms, and expectations influence EFL learners' participation and perceptions of OCW activities, especially within the Ethiopian context.

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