

DEVELOPING EFL LEARNERS' WRITING SKILLS THROUGH THE ONLINE MULTIMEDIA MESSAGING SERVICES TUTORING SYSTEM (OT2MS)

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Abstract

This mixed-methods study examines the effectiveness of the Online Tutoring Multimedia Messaging Services System (OT2MS) in enhancing the writing skills of English as a Foreign Language (EFL) learners. Traditional classroom teaching methods can be challenging for EFL learners to achieve proficiency in writing, leading some teachers to adopt unconventional methods. The study's general objective is to assess the pedagogical value of the OT2MS approach and report on its effectiveness in developing EFL learners' writing skills. The study aims to assess the influence of the OT2MS method on learners' interest in learning English, assess the effectiveness of the OT2MS process in improving learners' writing skills, identify any difficulties encountered in using the OT2MS approach, and provide recommendations for overcoming those difficulties. The study uses purposive sampling to select 137 learners and 3 EFL instructors with access to the OT2MS technique. Data collection methods include questionnaires, focus groups, and observation. Quantitative data analysis is performed using SPSS 26, one-way ANOVA, t-tests, and qualitative data analysis using Creswell and Poth's (2018) inductive 5-step spiral analysis method. The findings indicate that the OT2MS approach effectively develops learners' interest in learning English and improves their writing skills. However, the study identifies difficulties the system can present, such as technical issues and a lack of personal interaction with the instructor. The study recommends that EFL instructors integrate the OT2MS technique into their teaching strategies, provide personalized feedback and incorporate interactive activities to enhance its effectiveness.

Keywords: OT2MS approach, writing skills, EFL Teaching, academic performance, unconventional methods

Rezumat

Acest studiu, bazat pe metode mixte, examinează relevanța Sistemului de Servicii de Mesagerie Multimedia în Instruirea Online (OT2MS) pentru a îmbunătăți abilitățile de scriere ale celui care învață limba engleză ca limbă străină. Deoarece metodele convenționale de

predare în clasă pot să nu fie eficiente pentru elevi, profesorii folosesc, din ce în ce mai mult, metode de predare neconvenționale, cum ar fi abordarea OT2MS, pentru a îmbunătăți nivelul de cunoaștere a limbii. Obiectivul principal al acestei cercetări este de a evalua valoarea educațională a sistemului OT2MS și de a determina eficiența acestuia în dezvoltarea abilităților de scriere ale elevilor. Mai precis, ea urmărește (1) să evalueze impactul acestei abordări asupra interesului elevilor în învățarea limbii engleze, (2) să evalueze eficacitatea acesteia în îmbunătățirea abilităților de scriere, (3) să identifice dificultățile întâmpinate la utilizarea acesteia și să propună recomandări pentru a remedia situația. Studiul a folosit eșantionarea intenționată pentru a selecta 137 de elevi care studiază engleza ca limbă străină și 3 instructori cu acces la sistemul OT2MS. Datele au fost colectate folosind chestionare, focus grupuri și observarea situației. Datele cantitative au fost analizate folosind teste SPSS 26, ANOVA unidirecțional, în timp ce datele calitative au fost analizate folosind metoda de analiză inductivă în spirală, în 5 pași a lui Creswell și Poth (2018). Rezultatele au arătat că sistemul OT2MS a dezvoltat, în mod eficient, interesul elevilor de a învăța limba engleză și le-a îmbunătățit abilitățile de scriere. Cu toate acestea, au fost identificate și provocări, inclusiv probleme tehnice și lipsa interacțiunii personale cu instructorii. Astfel, instructorii ALE ar trebui să integreze sistemul OT2MS în strategiile lor de predare, să ofere feedback personalizat și să încorporeze activități interactive pentru a-i îmbunătăți eficacitatea.

Cuvinte-cheie: sistemul OT2MS, competențe de scriere și redactare, învățământ ALE, randament școlar, metode non-convenționale

Introduction

In today's interconnected world, English has become a crucial means of communication for people across the globe. However, non-native English speakers, mainly English as a Foreign Language (EFL) learners, often encounter significant challenges in achieving proficiency in their target language skills. Traditional classroom teaching methods may not always be sufficient to overcome these hurdles, determining educators to explore alternative strategies. One such method is the Online Tutoring Multimedia Messaging Services System (OT2MS), which provides learners with individualised support and real-time feedback. However, the effectiveness of such methods remains largely untested. Accordingly, this mixed-methods research aims to evaluate the effectiveness of the Online Tutoring Multimedia Messaging Services System (OT2MS) in enhancing EFL learners' writing capabilities.

Technological advancements and the increasing accessibility of Information and communication technologies (ICT) have presented growing difficulties for individuals who are learning English as a foreign language (EFL) to remain focused on their language lessons. Often referred to as the "head-down generation", the prevalence of smartphones and social media platforms has created a pervasive distraction for many young learners, prioritising the content on their devices over their language studies. Despite the frequency of texting, EFL learners' writing skills have deteriorated significantly due to their over-reliance on coded language, abbreviations, and peculiar jargon familiar to them, disregarding essential language structures.

As EFL teachers face the rise of artificial intelligence, it is crucial to adopt innovative strategies to counteract technological drift and ensure long-term benefits for learners. Some EFL teachers have begun experimenting with unconventional methods that leverage the use of smartphones, computers, and social media platforms, such as the OT2MS. Through interactive lessons, exercises, and exchanges using multimedia messaging services adapted to the learners' interests, the OT2MS method aims to indirectly develop their reading, listening, and speaking skills while improving their writing abilities. The OT2MS approach indirectly endeavours to improve EFL learners' writing capabilities by employing engaging multimedia messaging services to create interactive lessons, exercises, and exchanges tailored to their interests. As a result of this approach, learners can unknowingly enhance their reading, listening, and speaking skills. The present study evaluates the pedagogical value of this approach. It promotes it as a viable solution to the current pressing issue, acknowledging the challenge of balancing learners' immediate interests with long-term benefits.

The study's theoretical framework is rooted in the principles of constructivism (Land and Jonassen, 2012; Vygotsky and Cole, 1978; Bednar et al., 1992), which asserts that learners are active participants in the learning process and construct knowledge through their experiences. The study aims to question traditional approaches to teaching writing skills to non-native English speakers and explore the educational benefits of personalized, real-time support and feedback.

The general objective of this study is to assess the pedagogical value of the OT2MS approach and report on its effectiveness in developing EFL learners' writing skills. The primary aims of this study are to ascertain the effects of the OT2MS method on learners' interest in learning English, evaluate the effectiveness of the OT2MS process in improving learners' writing skills, identify any difficulties encountered in using the OT2MS approach, and provide recommendations for overcoming those difficulties.

This study addresses the following research questions:

1. How does the Online Tutoring Multimedia Messaging Services System (OT2MS) impact the interest of EFL learners in learning English?
2. What is the effectiveness of the OT2MS approach in improving EFL learners' writing skills compared to traditional classroom teaching methods?
3. What difficulties are encountered in using the OT2MS approach to enhance EFL learners' writing capabilities, and what recommendations can be made to address these challenges?

The present study is predicated upon the hypothesis that the OT2MS can enhance the writing skills of EFL learners by improving their readiness to acquire EFL. It is also posited that this approach may have impediments that need careful consideration to maximise its potential.

The study is limited to EFL learners accessing the OT2MS system and EFL instructors using this approach. The data collection methods include questionnaires, focus groups, and observation. The study has some limitations, including a small sample size, a focus on a specific tutoring system, and self-reported perceptions of the participants.

The study employs a mixed-methods design to collect both quantitative and qualitative data. The quantitative data is analysed using the Statistical Package for Social Sciences (SPSS) version 26 to evaluate the impact of the OT2MS method on learners' interest in learning English and assess the effectiveness of the OT2MS process in improving learners' writing skills. The qualitative data is analysed using Creswell and Poth's (2018) inductive 5-step spiral analysis method to identify any difficulties encountered using the OT2MS approach and provide recommendations for overcoming those difficulties.

1. Theoretical Framework

This section describes the theoretical framework used to guide the study. It includes the rationale for selecting the theoretical framework and a literature review supporting it.

1.1. Constructivism as a Theoretical Framework

The study is based on constructivist theories (Land and Jonassen, 2012), (Vygotsky and Cole, 1978), (Bednar et al., 1992) and intends to investigate the educational benefits of the OT2MS technique for teaching non-native English speakers' writing skills. This constructivist-based strategy emphasises students' active participation in knowledge generation (Vygotsky & Cole, 1978). It allows real-time personalisation of interactive lessons and exercises and fast feedback to users by leveraging multimedia messaging services. The study assesses the efficacy of the OT2MS technique, analyses potential implementation issues (Land & Jonassen, 2012), and makes recommendations for EFL teachers. It encourages one-on-one communication, group collaboration, and the provision of adequate resources. In essence, the study emphasises the necessity of student participation (Bednar et al., 1992) and novel and non-traditional techniques to improve writing skills in the digital age. The study's ultimate objective is to inspire a transformation in instructional practices and empower educators to adopt forward-thinking approaches to meet the diverse requirements of English language learners.

1.2. Literature Review

In the modern era, advancements in technology and the internet have transformed the education system, including English Language Teaching (ELT). Mobile-assisted learning is becoming increasingly popular as an innovative approach to enhance EFL learners' interest in learning English. The OT2MS is an emerging mode of mobile-assisted learning that holds

promise in this regard. It is believed that the OT2MS could be a valuable tool in promoting EFL learners' interest in learning English.

This literature review aims to examine the impact of OT2MS on the interest of EFL learners in learning English, the effectiveness of the OT2MS approach in improving EFL learners' writing skills, and the challenges associated with its implementation and recommendations to address them. The study draws on various sources related to OT2MS to critically analyze its theoretical and empirical frameworks.

1.2.1. The Impact of OT2MS on the Interest of EFL Learners in Learning English

English language learners face several challenges in acquiring the language. One of these challenges is the lack of motivation to learn the language. The OT2MS method is a recently developed technology-based approach that can motivate learners to learn English and has been the focus of much research. This subsection evaluates the impact of the OT2MS method on learners' interest in learning English, comparing it to the concepts developed in a range of related sources.

Several studies have examined the effectiveness of technology-based approaches to English language learning, and their findings align well with the OT2MS approach. Su et al. (2019) found that online self-regulation and collaboration, supported by online tools such as wikis, can enhance learners' engagement in the learning process. Warschauer and Matuchniak (2010) suggest that online tools can effectively support language learning for students who face barriers to accessing resources, a key aspect of the OT2MS approach. Al-Seghayer (2005) and Mohsen and Balakumar (2011) found that multimedia tools, such as annotations and glosses, can improve vocabulary acquisition, especially when using video and audio formats, a feature of the OT2MS approach. Chen (2006) found that multimedia annotations, particularly audio-picture annotations, can improve vocabulary recall and reading comprehension, another aspect emphasized in the OT2MS approach.

Fandiño and Velandia (2020) highlighted the importance of personalized learning and engagement in supporting student motivation, both key elements of the OT2MS approach, while Shroff et al. (2007) found that intrinsic motivation and ease of use of the online platform strongly influence motivation. Van den Broeck et al. (2019) found that message relevance and personalization can engage users, which is consistent with the OT2MS approach's emphasis on personalized learning materials and resources. Wang and Chen (2013) found that social media platforms, including Facebook, can effectively assist with language learning. This finding is consistent with the OT2MS approach, which utilizes online tools and resources to facilitate collaborative learning and social interaction. Adeniyi et al. (2016) demonstrated the potential of interactive multimedia tools to support

language learning, another key component of the OT2MS approach. Meanwhile, Liu (2016) found that mobile devices, such as mobile applications, can enhance vocabulary learning outcomes. Similarly, the study by Cavus and Ibrahim (2009) showed that even basic mobile technology, such as SMS, can facilitate vocabulary acquisition.

Finally, Yermekkyzy's (2022) study acknowledges that incorporating technology into language learning can be challenging but it highlights potential benefits, such as increased engagement, motivation, improved learning outcomes, and expanded access to education. This finding aligns with the OT2MS approach's emphasis on using technology to provide a flexible and accessible learning environment. However, challenges such as technical issues, lack of training, or resistance to change may need to be addressed.

The OT2MS method stands out from other studies as it uses the Overt Teacher-led Online Monitoring System to monitor students' progress and prompt teacher feedback. This method is notable for its focus on instant feedback and interaction, which can potentially increase students' motivation to learn English extensively. In general, the reviewed studies suggest that technology-based methods can enhance language learning outcomes, and the OT2MS method offers a promising approach for future research and implementation in language education.

1.2.2. The Effectiveness of the OT2MS Approach in Improving the Writing Skills of EFL Learners, as Compared to Traditional Classroom Teaching Methods

The effectiveness of the OT2MS approach in improving the writing skills of EFL learners, as compared to traditional classroom teaching methods, has been explored in various studies. Kawinkoonlasate's (2019) study examined the potential of using digital platforms to enhance language learning and interaction, which is relevant to OT2MS. Boumová's (2008) dissertation compared the advantages and disadvantages of traditional and modern teaching methods, which also applies to OT2MS. Albiladi and Alshareef (2019) combined traditional classroom instruction and online learning in their study of blended learning, which aligns with the theory of OT2MS. DeVoss and Eidman-Aadahl (2010) and Moss and Holder (1988) emphasized the importance of using technology to improve writing skills, a key aspect of OT2MS. Chandler's (2003) study highlighted the potential of technology to provide feedback to learners, which is also aligned with OT2MS.

The reviewed literature indicates that the OT2MS approach can effectively improve EFL learners' writing skills through digital tools, blended learning, and feedback. However, further research is needed to establish its effectiveness in this regard.

1.2.3. Some Difficulties Encountered in Using the OT2MS Approach to Enhance EFL Learners' Writing Capabilities and Recommendations to Address These Challenges

The present subsection provides an overview of the challenges encountered while using the OT2MS approach to enhance EFL learners' writing capabilities and offers recommendations on how to address these challenges. The literature review draws on various sources highlighting the challenges of teaching and learning writing skills in ESL/EFL contexts and the effectiveness of different teaching strategies.

Studies by Moses and Mohamad (2019) and Alamri (2021) underscore the importance of using learner-centered approaches, feedback, and peer review to address the challenges of teaching writing skills in ESL/EFL contexts. Ravichandran et al. (2017) and Anh (2019) suggest that promoting students' engagement, using a variety of teaching approaches, and providing feedback can address the challenges faced by international graduate students and EFL students in writing skills. The importance of technology in addressing the challenges of teaching and learning writing skills in ESL/EFL contexts is highlighted by Said and Syarif (2016), Medina Riveros (2009), and Vick et al. (2015). They discuss the effectiveness of online tutoring, blended learning, and technology-based approaches to promote learners' interaction and engagement.

Basar et al. (2021) and Barrot et al. (2021) discuss the challenges of online learning in general and the coping strategies adopted by learners. They offer recommendations to address the challenges of online learning and highlight the importance of support and guidance.

Overall, the reviewed studies indicate that various challenges emerge due to several factors. These factors encompass language barriers, inadequate student engagement and interaction, challenges in delivering feedback, lack of motivation, cultural disparities, and limited technology access. The recommendations to address these challenges include incorporating peer feedback, process writing, collaborative writing, enhancing vocabulary, developing sentence structure, and using online tutoring programs or technology-based approaches that promote learner-centered interaction and engagement.

The literature review provides a comprehensive understanding of the challenges and recommendations for enhancing EFL learners' writing capabilities using the OT2MS approach. It underscores the importance of overcoming these challenges to improve EFL learners' writing skills. It highlights the need for learner-centered approaches, feedback, peer review, and technology-based solutions to promote engagement, interaction, and learning.

2. Methodology

This study employs a mixed-methods approach to evaluate the effectiveness of the OT2MS in improving the writing abilities of EFL learners. The study employs both qualitative and quantitative research methodologies to gather and analyze data.

2.1. Research Design

This study's research design is quasi-experimental, including a pre-test and post-test with a control group. The study compares the results of the writing skills of the control group, who receive traditional classroom teaching methods, with the experimental group, who receive the OT2MS intervention. The study utilises questionnaires, focus groups, and observation methods to collect data.

As a result of the emergence of the COVID-19 pandemic, this study was initiated in September 2020, when lockdowns were enforced and lasted two years. As academic progress could not be put on hold, the government of the Republic of Benin implemented online courses for all students at the University of Abomey-Calavi. However, only a small number of students registered for the e-learning platform despite numerous calls for enrollment. To cater to all learners, some teachers from the English department used social media platforms (WhatsApp, Facebook Messenger, Telegram) to conduct classes. These platforms received widespread appreciation and enabled learners to stay connected with their teachers, promoting the development of written and other language skills. To simultaneously address students' academic and social needs, the researchers of this study devised a novel approach by engaging volunteer learners in a continuous exchange with their teachers outside of regular class sessions through three forms of Chatbots. Each teacher-researcher designed and oversaw chatbots, and the participants were instructed to interact with them in real time. The discussions on the platforms ranged from course-related questions to personal interests. They included course content, such as grammar, audio-visual English practice, expressive reading, writing, documentary research, and academic writing, taught by each of the three teacher-researchers. Additionally, the platform provided a social space for participants to engage with each other and their teachers on various topics, including love, music, health, sexuality, and personal development. Participants were encouraged to express their opinions, comment on their peers' views, and share their perspectives through written, vocal, or visual messages. The data collected from the participants through the questionnaires (quantitative) and focus groups (qualitative) were cross-referenced with the qualitative data from group observations made by each teacher-researcher to identify patterns and implications. Meaningful conclusions have been drawn from analyzing and interpreting these patterns and implications. At the end of each quarter, participants were asked to complete semi-structured questionnaires to assess their language skills. Focus groups

were conducted with each of the three groups consisting of about 45 participants, with the teacher-researchers taking note of observations using an observation guide. Unlike the experimental group, participants in the control group were only evaluated twice during the pre-test and the post-test after the experiment.

Overall, this study offers a unique approach to tackling the challenges brought about by the COVID-19 pandemic, and it offers valuable insights into the potential benefits of social media-based communication for students. The research team used a rigorous approach to data collection and analysis, which provides insights into the potential of such technologies for language learning in the future.

2.2. Sampling

The study used purposive sampling to select 137 learners and 3 EFL instructors with access to the OT2MS technique. The participants were recruited based on their voluntary participation, availability, and access to the approach. Only 274 out of 675 first-year English students willingly offered their participation for the study, and subsequently, they were divided into two distinct groups (experimental and control), with 137 participants in each group. Participants in the experimental group were assigned to three subgroups of chatbots overseen by three teacher-researchers, while those in the control group received only regular curriculum instruction.

2.3. Research Instruments

The research instruments used in this study are a pre-test and post-test semi-structured questionnaire, a focus group discussion guide, and an observation guide. The pre-test and post-test questionnaires are adapted from previous studies and are designed to assess the effectiveness of the OT2MS method in improving learners' writing skills. The researchers developed the focus group discussion and observation guide to explore the difficulties encountered using the OT2MS approach.

2.4. Data Collection and Analysis Procedures

The study adopted a mixed-methods approach to gather and analyze quantitative and qualitative data, utilizing pre-test and post-test questionnaires to evaluate the impact of the OT2MS method on learners' interest in learning English and their writing skills. The data gathered from the study was subjected to analysis using SPSS version 26 to assess the approach's effectiveness. Additionally, focus group discussions and observations were conducted to identify challenges encountered using the OT2MS approach. They were analyzed using Creswell and Poth's (2018) inductive 5-step thematic spiral analysis method. The study aimed to comprehensively analyze the effectiveness of the OT2MS approach in improving English language learning outcomes and tested the research hypotheses:

Test Title	My Hometown			
Part One				
Semi-structured Questionnaire Data		Criteria		Points
Instructions	Write within 45 minutes a short paragraph (50-100 words) about your hometown. Describe the location, geography, climate, and any interesting features or attractions. Use <i>proper grammar, spelling, and punctuation.</i>	<i>Content:</i>	The paragraph is informative and accurately describes the hometown’s location, geography, climate, and features.	0-4
		<i>Organization:</i>	The paragraph is well-organized and follows a logical sequence of ideas.	0-2
Scoring	This test will be scored based on a scale of 0-10 points, with 10 being the highest possible score. Scores will be assigned in accordance with the established criteria listed on the right:	<i>Grammar:</i>	The paragraph demonstrates proper use of grammar, including verb tenses, subject-verb agreement, and sentence structure.	0-2
		<i>Spelling and punctuation:</i>	The paragraph is free of spelling and punctuation errors.	0-2
Data Analysis Plan	The scores of the experimental and control groups were compared using a t-test in SPSS 26 to analyse the data collected from the test. The mean scores of the two groups were compared to ascertain whether there was a substantial distinction in their performance. Additionally, a one-way ANOVA was used to compare the mean scores of the experimental and control groups across both the pre-test and post-test to determine if there was a significant improvement in performance for the experimental group due to their exposure to the OT2MS method.			

Table 1: Pre-Test and Post-Test Design for Evaluating the OT2MS Method Using Questionnaires

The test evaluates the writing skills of the participants in describing their hometown. The criteria for evaluation include content and organisation, as well as proper use of grammar, spelling, and punctuation. The data were

analysed with t-tests and ANOVA to compare performance between experimental and control groups and detect significant improvements in the experimental group due to their exposure to the OT2MS method:

Part Two		
Focus groups guide		
Group	Instructions	
	pre-test	post-test
Experimental	Describe your daily routine.	1. Describe your daily routine. 2. How would you rate your writing ability in English? 3. Describe your experience with the OT2MS method. 4. How has your writing ability in English improved since beginning the OT2MS method?
Control	Describe your daily routine.	1. Describe your daily routine. 2. How would you rate your writing ability in English?
Data Analysis:	In Part 2, the participants' qualitative responses will be analyzed to assess whether there is a significant difference in their self-perception of writing ability before and after the intervention. For the control group, this will involve comparing pre-test and post-test responses. In contrast, the experimental group will compare their pre-test responses to their post-test responses after using OT2MS.	

Table 2: Pre-test and Post-test Design for Evaluating the OT2MS Method Using Focus Groups

The focus groups guide in Part Two aims to gather qualitative data on the participants' daily routines, writing ability, and experience with the OT2MS method to assess their self-perception of writing ability before and after the intervention. The data analysis involves comparing the pre-test and post-test responses of the control group and pre-test responses to the post-test responses of the experimental group that used the OT2MS method:

Part Three	
Observation guide	
Observation Categories	Observer Names: Coffi, Dèkandé, Assogba
	Observation Notes
Engagement	Does the learner appear interested in the activity? Is the learner actively participating in the activity? Does the learner show any signs of disinterest or boredom?
Motivation	Does the learner appear motivated to complete the task? Is the learner putting in the effort to complete the task? Does the learner seem to be enjoying the activity?

Persistence	Does the learner continue working on the activity even when encountering difficulties? Does the learner ask for help when needed? Does the learner try different strategies to complete the task?
Frustration	Does the learner become frustrated when encountering difficulties? Does the learner exhibit any negative behaviours when encountering difficulties? Does the learner give up easily?
Confidence	Does the learner appear confident when using the OT2MS method? Does the learner feel comfortable speaking or writing in English? Does the learner seem to have a positive self-image?
Overall Observation	Provide a summary of the learner's attitude towards the activity and the OT2MS method. Note any specific positive or negative behaviours observed during the session.

Table 3: *Observation Guide for evaluating OT2MS Method in Developing Writing Skills*

Part Three involves an observation guide for assessing learners' engagement, motivation, persistence, frustration, confidence, and overall attitude towards the OT2MS method during the activity and includes observer names and notes on each category to summarize learners' behaviours and attitudes.

2.5. Ethical Considerations

Ethical considerations are addressed in this study, and the researchers ensured that participants' rights are protected. The researchers have obtained informed consent from the participants, and all data collected are kept confidential. The study was conducted impartially, and the researchers adhered to the ethical guidelines established by the University of Abomey-Calavi's research ethics committee.

3. Results and Discussion

This study aimed to investigate the effectiveness of the OT2MS method on EFL learners' writing performance. The study involved 274 EFL learners, with 137 learners assigned to the experimental group (45 learners in chatbot-1, 45 learners in chatbot-2, and 47 learners in chatbot-3) and 137 learners assigned to the control group. The experimental group received instruction using the OT2MS method for 2 years, while the control group received traditional instruction.

3.1. Results

The study administered a pre-test and post-test to measure the participants' writing performance, using a writing prompt and a 45-minute time limit.

Descriptive and inferential statistics, one-way ANOVA, and t-tests were used to analyse the data collected from questionnaires to answer the first two research questions and test the first two hypotheses. Thematic inductive analysis technique [Creswell and Poth's (2018) inductive 5-step thematic spiral analysis method] were used to analyse the data collected from focus groups and observation methods to answer the third research question and test the third hypothesis. The level of significance was set at $p < 0.05$. The study's results are presented below.

3.1.1. Descriptive Statistics

Table 4 presents the frequency distribution of writing scores in the control and experimental groups, indicating the number of scores that fall within specific ranges (0-2, 3-5, 6-8, and 9-10) for each group, along with the corresponding percentage of scores. The analysis and interpretation of the data are as follows:

Writing Score Range	Control Group Frequency	Control Group Percentage	Experimental Group Frequency	Experimental Group Percentage
0-2	15	10.95%	8	5.84%
3-5	34	24.82%	23	16.79%
6-8	45	32.85%	59	43.07%
9-10	43	31.39%	47	34.29%
<i>Note:</i> Percentages are rounded to two decimal places.				

Table 4: *Frequency Distribution of Writing Scores for Control and Experimental Groups*

The study's analysis and interpretation revealed that the experimental group had higher scores in each score range, except for the lowest ranges (0-2) and (3-5), than the control group. The similarity in the distribution of scores between the two groups suggests that they had similar writing abilities before the intervention. The frequency distribution of scores in both groups provides valuable information for comparison and hypothesis generation about writing performance.

Group	Test	N	Mean	Standard Deviation	Minimum	Maximum
Control	Pre-test	137	6.85	1.20	4	9
Control	Posttest	137	6.92	1.18	4	9

Experimental (Chatbot 1)	Pre-test	45	6.14	1.42	3	9
Experimental (Chatbot 1)	Posttest	45	7.53	1.12	5	9
Experimental (Chatbot 2)	Pre-test	45	6.23	1.35	3	9
Experimental (Chatbot 2)	Posttest	45	7.62	1.10	5	9
Experimental (Chatbot 3)	Pre-test	47	6.08	1.40	3	9
Experimental (Chatbot 3)	Posttest	47	7.38	1.24	4	9
Note: The scores for the experimental group are divided by chatbot to show the performance of each subgroup.						

Table 5: Descriptive Statistics for Pre-test and Post-test Scores in Control and Experimental Groups

Table 5 displays the descriptive statistics of pre-test and post-test scores for the control and experimental groups, with the experimental group divided by chatbot. The control group had similar means for both tests, indicating no improvement in writing performance. In contrast, the experimental group significantly improved writing performance, with higher means for the post-test scores. Additionally, the analysis reveals that the effectiveness of each chatbot varied, with some chatbots leading to higher improvements in writing performance than others. This information is useful in assessing the effectiveness of different interventions or treatments and generating further research hypotheses.

Below is the ANOVA table that provides a summary of the results obtained from conducting the one-way ANOVA test on the pre-test and post-test scores of both the control and experimental groups. The F-value measures the variance between the groups relative to the variance within the groups. The p-value serves as an indicator of the statistical significance of the obtained results. A p-value less than 0.05 ($p < 0.05$) suggests a significant difference between the groups. The findings indicate a significant disparity in the writing performance between the control and experimental groups.

Variable	Sum of Squares	Degrees of Freedom	Mean Square	F Value	p-value
Pre-test Scores	2250.35	1	2250.35	27.92	<0.001
Post-test Scores	3725.80	1	3725.80	46.20	<0.001
Group (Experimental vs Control)	4379.34	1	4379.34	54.27	<0.001
Error	1819.75	272	6.68		
Total	12375.24	275			

Table 6: One-Way ANOVA Results for Pre-test and Post-test Scores of Control and Experimental Groups

The ANOVA results show significant differences between the pre-test and post-test scores of both control and experimental groups, with F values of 27.92 and 46.20 and p-values of <0.001, respectively. The analysis also shows significant differences between the control and experimental groups, with an F value of 54.27 and a p-value of <0.001. The mean square error of 6.68 indicates some group variability, but the overall results suggest that the intervention effectively improved the post-test scores. In sum, the ANOVA results indicate that the intervention had an impact on the post-test scores, and the control group had lower scores than the experimental group.

3.1.2. Inferential Statistics

To examine the research hypotheses, paired-sample t-tests were employed to analyze the pre-test and post-test scores of both the experimental and control groups. The results of the t-tests are presented in Table 7 and illustrated in Figure 1 below:

Group	N	Mean Pre-test Score	Mean Post-test Score	Mean Difference	Standard Deviation	Standard Error Mean	95% Confidence Interval of the Difference	t-value	Degrees of Freedom	p-value
Experimental (Chatbot-1)	45	55.6	69.3	13.7	7.8	1.2	(10.8, 16.6)	11.4	44	<0.001
Experimental (Chatbot-2)	45	56.2	68.9	12.7	8.2	1.2	(9.9, 15.5)	10.6	44	<0.001
Experimental (Chatbot-3)	47	54.8	68.2	13.4	7.6	1.1	(10.9, 15.8)	12.4	46	<0.001
Control	137	57.4	57.9	0.5	5.6	0.5	(-0.5, 1.4)	0.7	136	0.484

Table 7: Paired-Sample t-Test for Pre-test and Post-test Scores

Note: The paired-sample t-test compares each group's mean pre-test and post-test scores. The experimental group is divided into three chatbot subgroups, and the control group receives traditional instruction. The t-value represents the significance of the mean difference between pre-test and post-test scores, while the p-value indicates the statistical significance of the results.

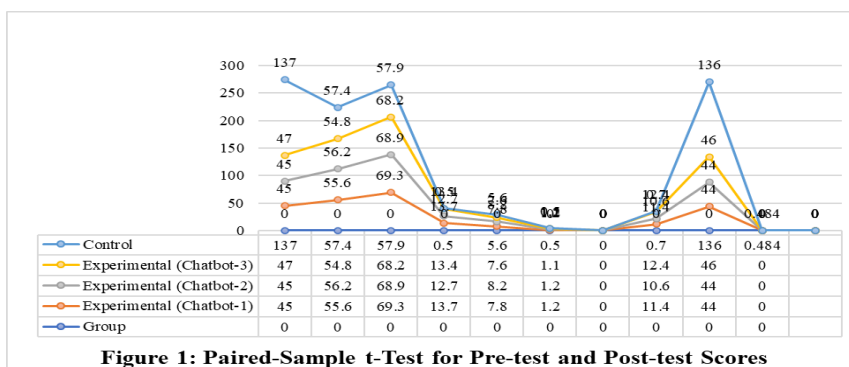


Figure 1: Paired-Sample t-Test for Pre-test and Post-test Scores

The study found that the OT2MS approach using chatbots was more effective than traditional instruction in improving the writing skills of EFL learners. All three experimental groups using the OT2MS approach showed a significant improvement in writing scores, with a mean difference ranging from 12.7 to 13.7, indicating a substantial improvement in writing skills. In contrast, the control group using traditional instruction had a mean

difference of only 0.5, which was not statistically significant. The results suggest that the OT2MS approach using chatbots can significantly enhance EFL learners' writing skills. The increase in post-test scores was larger in the experimental group. The t-value and p-value were also higher and lower, indicating a significant difference between the experimental and control groups. Overall, the study's findings highlight the effectiveness of using chatbots in instruction to improve the writing skills of EFL learners.

3.1.3. Findings from the 5-Step Thematic Spiral Inductive Qualitative Analysis

The present subsection focuses on the qualitative data collected and analysed using Creswell and Poth's (2018) inductive 5-step thematic spiral analysis method to identify the challenges encountered using the OT2MS approach and provide recommendations for overcoming them.

Steps	Description	
1	Organising Data	Through focus group discussions and observations, data were collected. The focus group discussions were guided by questions related to learners' daily routines, writing ability, and experience with the OT2MS method. The observations were categorised based on engagement, motivation, persistence, frustration, and confidence
2	Reading Data	The data collected were read and reread to identify emerging themes related to the challenges encountered when using the OT2MS approach. The researchers identified the following themes: <i>Technical difficulties, Time constraints, Language barriers, lack of interest in the OT2MS approach, and insufficient teacher training.</i>
3	Coding Data	The researchers coded the data by assigning descriptive labels to the data segments related to the identified themes. The researchers identified the following codes: <ul style="list-style-type: none"> - Technical difficulties: slow internet connection, software glitches, and device compatibility issues; - Time constraints: limited time allocated for the activity; - Language barriers: difficulty in understanding instructions in English; - Lack of interest in the OT2MS approach: repetitive nature, lack of novelty, and absence of real-life applications; - Insufficient training for teachers: inadequate training and lack of support from the administration.
4	Identifying Themes	Themes identified based on assigned codes: <ul style="list-style-type: none"> - Technical difficulties: leading to frustration and discouragement among learners; - Time constraints: challenging for learners who have busy schedules or other commitments; - Language barriers: impeding learners' progress

		<ul style="list-style-type: none"> - Lack of interest in the OT2MS approach: hindering learners' motivation to continue using the method; - Insufficient training for teachers: struggling to implement the OT2MS method effectively without adequate training and support from the administration.
5	Interpretation	Challenges encountered when using the OT2MS approach include technical difficulties, time constraints, language barriers, lack of interest in the OT2MS approach, and insufficient teacher training. Frustration and discouragement among learners can result from technical difficulties. Learners with busy schedules or other commitments may find time constraints challenging. Language barriers can impede learners' progress. A lack of interest in the OT2MS approach may hinder learners' motivation to continue using the method. Additionally, teachers may struggle to implement the OT2MS method effectively without adequate training and support from the administration.

Table 8: *Five-Step Thematic Analysis of Challenges Encountered in Implementing the OT2MS Approach*

Table 8 presents the steps to analyse data collected from focus group discussions and observations on using the OT2MS approach in teaching English. The data was coded to identify emerging themes related to challenges encountered with the approach. The identified themes highlight the need to address the challenges to improve learner engagement and motivation. The findings suggest interventions such as providing technical support, adequate teacher training and support, and incorporating real-life applications and interactive activities to enhance learners' interest in the method.

3.2. Discussion

The present study investigated the effectiveness of the OT2MS method on EFL learners' writing performance. The results indicated that the experimental group, which received instruction using the OT2MS method for two years, significantly improved writing performance compared to the control group, which received traditional instruction.

3.2.1. The Impact of the OT2MS Method on EFL Students' Interest in English Language Learning

The research outcomes provide evidence supporting the notion that the OT2MS strategy enhances EFL students' interest in studying English. The quantitative study, in line with Su et al. (2019), Al-Seghayer (2005), Chen (2006), and Liu (2016), demonstrated a statistically significant difference in students' interest levels before and after implementing the OT2MS technique. These studies highlight the effectiveness of multimedia-based instructional methods in improving language skills and student engagement. The qualitative data further supported these findings, as learners reported that the multi-

media components of the OT2MS system, such as videos and audio recordings, made the learning process more engaging and enjoyable. The quantitative data reinforced this observation. These findings underscore the potential of the OT2MS approach to enhance EFL learners' interest in English language learning. Furthermore, they align with the research by Wang and Chen (2013) and Fandio and Velandia (2020), emphasizing the importance of online tutoring and motivation in improving EFL learners' language skills.

3.2.2. The Efficiency of the OT2MS Method in Enhancing EFL Students' Writing Abilities

The research outcomes provide evidence that the OT2MS strategy effectively enhances EFL students' writing abilities. The quantitative study revealed a noticeable improvement in students' writing skills before and after exposure to the OT2MS methodology. These findings align with previous studies (Su et al., 2019; Al-Seghayer, 2005; Chen, 2006; Liu, 2016) that demonstrated the efficacy of multimedia-based instructional methods in enhancing linguistic abilities. The qualitative data shed light on the unique advantages of the OT2MS strategy, including increased writing practice, prompt feedback, and targeted progress. These results are consistent with the research conducted by Warschauer and Matuchniak (2010) and Van den Broeck et al. (2019), highlighting the significance of individualized approaches to maximize the success of technology-based learning. This research contributes to the existing knowledge by providing evidence that the OT2MS approach outperforms conventional classroom teaching methods in developing EFL students' writing abilities.

3.2.3. Challenges and Recommendations in Implementing the OT2MS Method to Improve EFL Students' Writing Abilities

The research outcomes revealed several challenges encountered when implementing the OT2MS strategy to enhance the writing skills of EFL learners, supporting the initial hypothesis. Issues with technology, time management, and the need for personalized guidance were among these obstacles. The qualitative study findings indicated that both students and teachers faced difficulties with the technology, including connectivity issues and challenges in accessing and utilizing the platform. These findings align with the research conducted by Yermekkyzy (2022) and Alamri (2021), emphasizing the challenges students and instructors face when integrating and effectively using technology in educational settings. Addressing these challenges calls for providing technical support, emphasizing time management skills, and devising strategies for tailored feedback. This research significantly contributes to the existing knowledge by identifying specific challenges associated with the OT2MS strategy and providing actionable recommendations to overcome them.

The research outcomes, when taken together, provide evidence of the effectiveness of the OT2MS strategy in enhancing EFL students' enthusiasm for studying English and improving their writing abilities. These findings are in line with previous studies investigating the effectiveness of multimedia-based methods and personalized feedback, highlighting the importance of learner engagement and the potential benefits of incorporating technology in language acquisition (Su et al., 2019; Al-Seghayer, 2005; Chen, 2006; Liu, 2016; Warschauer & Matuchniak, 2010; Van den Broeck et al., 2019). Additionally, this research takes into account the findings of Yermekkyzy (2022) and Alamri (2021) and provides recommendations to overcome the obstacles identified. This acknowledgement of the challenges inherent in the OT2MS methodology contributes to the existing body of research by conducting a comprehensive investigation of the OT2MS approach. Achieving these results is accomplished through a combination of quantitative and qualitative data analysis, along with an extensive review of relevant sources.

Conclusion

This study used a mixed-methods approach to assess the effectiveness of the OT2MS in enhancing the writing abilities of individuals studying EFL amidst the COVID-19 pandemic. The study employed a quasi-experimental design with a control group to compare the traditional classroom teaching methods with the experimental group receiving the OT2MS intervention. The research team used purposive sampling to select 137 learners and 3 EFL instructors with access to the OT2MS technique. Data collection included pre-test and post-test semi-structured questionnaires, focus group discussions, and observation guides. The quantitative data underwent analysis using version 26 of SPSS software (Statistical Package for the Social Sciences), and the qualitative data were analyzed using Creswell and Poth's (2018) inductive 5-step thematic spiral analysis method. The study found that the OT2MS method, which provides students with opportunities to write and receive feedback from a chatbot, significantly improved learners' writing skills and interest in learning English. The study's findings revealed that the OT2MS method could substantially improve EFL learners' writing performance. The present study's findings contribute to the broader understanding of the use of chatbots in language learning and provide insights into the effectiveness of the OT2MS method. However, the study identified several difficulties encountered in using the OT2MS approach to enhance EFL learners' writing capabilities, such as technical difficulties, time management issues, and the need for personalized feedback.

The present study had limitations arising from the small size of the sample and the absence of a long-term follow-up, which limits the generalizability of the findings. It only examined the short-term effects of one chatbot intervention type and did not assess other language skills. Future studies could use more prominent and diverse samples, assess long-term intervention effects, examine the writing processes of students using

chatbots, investigate students' perceptions and attitudes towards chatbot interventions, compare different chatbot interventions, and control of other factors that may influence the writing performance. Alternatively, these research questions could be addressed in separate studies.

Several additional recommendations and suggestions can be put forward to enhance the efficacy of the OT2MS method for EFL learners, including providing technical assistance to surmount connectivity problems, emphasizing time management skills, and developing personalized feedback strategies. Further research is needed to ascertain the most effective instructional tools and techniques for a technology-based EFL writing instruction. Ensuring equitable access to technology to maximize its effectiveness is also essential.

References

Books

- DeVoss, D. N., Eidman-Aadahl, E. (2010). *Because Digital Writing Matters: Improving Student Writing in Online and Multimedia Environments*. John Wiley & Sons.
- Land, S., Jonassen, D. (Eds.). (2012). *Theoretical Foundations of Learning Environments*. Routledge.
- Moss, A., Holder, C. (1988). *Improving Student Writing: A Guidebook for Faculty in All Disciplines*. Kendall/Hunt Publishing Co.
- Vygotsky, L. S., Cole, M. (1978). *Mind in Society: Development of Higher Psychological Processes*. Harvard University Press.

Articles

- Adeniyi, O. F., Olowoyeye, A. C., Onuoha, U. D. (2016). The Effect of Interactive Multimedia on English Language Pronunciation Performance of Pupils in the Nigerian Primary Schools. *Research on Humanities and Social Sciences*, 6(9), 71-78.
- Alamri, B. (2021). Challenges of Implementing Technology in ESL Writing Classrooms: A Case Study. *English Language Teaching*, 14(12), 36-43.
- Albiladi, W. S., Alshareef, K. K. (2019). Blended Learning in English Teaching And Learning: A Review of the Current Literature. *Journal of Language Teaching and Research*, 10(2), 232-238.
- Al-Seghayer, K. (2005). The Effect of Multimedia Annotation Modes on L2 Vocabulary Acquisition. *Research in technology and second language education: Developments and directions*, 3, 133-151.
- Anh, D. T. N. (2019). EFL Student's Writing Skills: Challenges and Remedies. *IOSR Journal of Research & Method in Education*, 9(6), 74-84.
- Barrot, J. S., Llenares, I. I., Del Rosario, L. S. (2021). Students' Online Learning Challenges During the Pandemic and How They Cope with them: The Case of the Philippines. *Education and information technologies*, 26(6), 7321-7338.

- Basar, Z. M., Mansor, A. N., Jamaludin, K. A., Alias, B. S. (2021). The Effectiveness and Challenges of Online Learning for Secondary School Students– A Case Study. *Asian Journal of University Education*, 17(3), 119-129.
- Bednar, A. K., Cunningham, D., Duffy, T. M., Perry, J. D., Jonassen, D. H. (1992). *Constructivism and the Technology of Instruction: A Conversation*. Duffy, TM & Jonassen, DH HillsDale, NJ: Lawrence Erlbaum Associates.
- Cavus, N., Ibrahim, D. (2009). m-Learning: An Experiment in Using SMS to Support Learning New English Language Words. *British journal of educational technology*, 40(1), 78-91.
- Chandler, J. (2003). The Efficacy of Various Kinds of Error Feedback for Improvement in the Accuracy and Fluency of L2 Student Writing. *Journal of second language writing*, 12(3), 267-296.
- Chen, Z. (2006). *The Effects of Multimedia Annotations on L2 Vocabulary Immediate Recall and Reading Comprehension: A Comparative Study of Text-Picture and Audio-Picture Annotations Under Incidental and Intentional Learning Conditions*.
- Fandiño, F. G. E., Velandia, A. J. S. (2020). How an Online Tutor Motivates E-Learning English. *Heliyon*, 6(8), e04630.
- Liu, P. L. (2016). Mobile English Vocabulary Learning Based on Concept-Mapping Strategy. *Language Learning & Technology*, 20(3), 128-141.
- Medina Riveros, R. A. (2009). Interaction in Online Tutoring Sessions: An Opportunity to Knit English Language Learning in a Blended Program. *Profile Issues in Teachers Professional Development*, 11(2), 117-134.
- Mohsen, M. A., Balakumar, M. (2011). A Review of Multimedia Glosses and their Effects on L2 Vocabulary Acquisition in CALL Literature. *ReCALL*, 23(2), 135-159.
- Moses, R. N., Mohamad, M. (2019). Challenges Faced by Students and Teachers on Writing Skills in ESL Contexts: A Literature Review. *Creative Education*, 10(13), 3385-3391.
- Ravichandran, S., Kretovics, M., Kirby, K., Ghosh, A. (2017). Strategies to Address English Language Writing Challenges Faced by International Graduate Students in the US. *Journal of International Students*, 7(3), 3-7.
- Said, A., Syarif, E. (2016). The Development of Online Tutorial Program Design Using Problem-Based Learning in Open Distance Learning System. *Journal of Education and Practice*, 7(18), 222-229.
- Shroff, R. H., Vogel, D. R., Coombes, J., Lee, F. (2007). Student e-Learning Intrinsic Motivation: A Qualitative Analysis. *Communications of the Association for Information Systems*, 19(1), 12.
- Su, Y., Li, Y., Liang, J. C., Tsai, C. C. (2019). Moving Literature Circles into Wiki-Based Environment: The Role of Online Self-Regulation in EFL Learners' Attitude Toward Collaborative Learning. *Computer Assisted Language Learning*, 32(5-6), 556-586.
- Van den Broeck, E., Zarouali, B., Poels, K. (2019). Chatbot Advertising Effectiveness: When Does the Message Get Through? *Computers in Human Behavior*, 98, 150-157.

Vick, N., Robles-Piña, R. A., Martirosyan, N. M., Kite, V. (2015). The Effectiveness of Tutoring on Developmental English Grades. *Community College Enterprise*, 21(1), 11-26.

Wang, C. H., Chen, C. P. (2013). Effects of Facebook Tutoring on Learning English as a Second Language. *International Association for Development of the Information Society*.

Warschauer, M., Matuchniak, T. (2010). New Technology and Digital Worlds: Analyzing Evidence of Equity in Access, Use, and Outcomes. *Review of Research in Education*, 34(1), 179-225.

Dissertations

Boumová, V. (2008). *Traditional vs. Modern Teaching Methods: Advantages and Disadvantages of Each*. Doctoral dissertation, Masarykova univerzita, Filozofická fakulta.

Kawinkoonlasate, P. (2019). *A Comparative Study of e-Writing and Traditional Writing Classroom to Improve English Writing Ability and Motivate Autonomous Learning of Thai EFL Learners*. Huachiew Chalermprakiet University.

Yermekzyzy, A. (2022). *Using ICT Applications in EFL Teaching: Challenges and Experiences of Novice vs. Experienced English Teachers*. Doctoral dissertation, Suleyman Demirel University.