Journal of English language Teaching and Learning

University of Tabriz

Volume 16, Issue 33, (Spring & Summer 2024)

The Effect of Web 2.0 Technology on Language Achievement and Self-Regulated Learning of EFL Learners: A Case of WhatsApp

Mohammad Ahmadnejad (Corresponding Author)
Department of English Language & Literature, University of Kurdistan, Iran
m.ahmadnejad@uok.ac.ir

Naseh Rahimi
Department of English Language & Literature, University of Kurdistan, Iran
rahimienglish@gmail.com

Rozhin Ghaslani
rozhin.ghaslani@yahoo.com
Department of English Language & Literature, University of Kurdistan, Iran

ARTICLE INFO:

Received date:
2024.02.16
Accepted date:
2024.04.29

Print ISSN: 2251-7995
Online ISSN: 2676-6876

Keywords:

Web 2.0, Learning Management System (LMS), WhatsApp, Self-regulation, EFL learners.

Abstract

This study scrutinized the impact of Web 2.0 on the language achievement and self-regulated learning of Iranian EFL learners in online language courses. A mixed-methods approach was employed to leverage the Learning Management System (LMS) alongside WhatsApp as a supplementary tool in the experimental group. In the quantitative segment conducted over a three-month semester, an experimental design was implemented involving 24 Iranian male and female students from the Iran Language Institute (ILI). These participants were divided into two coeducational online classes: LMS and WhatsApp were utilized in the experimental group (n=12), while the control group (n=12) solely employed LMS. Quantitative data were gathered using the Oxford Placement Test (OPT), the Language Learning Self-Regulated Scale, and pre-test and post-test assessments. Concurrently, the qualitative phase entailed interviews with 8 participants, aimed at capturing nuanced insights into the advantages and disadvantages of utilizing WhatsApp alongside LMS for online learning. The quantitative outcomes revealed a notable impact on language achievement and self-regulated learning among EFL learners in the experimental group, emphasizing WhatsApp's supplementary role. Furthermore, qualitative findings shed light on the multifaceted aspects of employing WhatsApp in conjunction with LMS, unveiling both its merits and drawbacks. The implications for online EFL classes are substantial, offering valuable insights into optimizing digital platforms for enhanced language learning experiences.

DOI: 10.22034/ELT.2024.60600.2613
Citation: Ahmadnejad, M; Rahimi, N; Ghaslani, R; (2024). The Effect of Web 2.0 Technology on Language Achievement and Self-Regulated Learning of EFL Learners: A Case of WhatsApp. *Journal of English Language Teaching and Learning*, 16(33), 46-73. DOI: 10.22034/ELT.2024.60600.2613

Introduction

Advances in educational technology have triggered a fundamental shift in learning paradigms, fostering a demand for immersive and engaging educational experiences (Hwang et al., 2024; Liu & Hwang, 2010). Recognizing technology's capacity to heighten motivation and engagement among learners (Ahmad & Hamad, 2020; Donnermann et al., 2021), students increasingly advocate for its integration into their academic endeavors. Blended learning environments, known for fostering active engagement, have shown promise in enhancing academic performance (Fathi & Rahimi, 2022; Ibrahim Abbas, 2017). In the realm of language education, understanding students' interaction with Information and Communication Technology (ICT) tools has become crucial due to the pervasive integration of technology across formal and informal language learning contexts (Kenning, 2007; Lee, 2022; Liu & Ma, 2023).

The transformative influence of Web 2.0 has significantly reshaped educational landscapes, urging language practitioners to leverage diverse Web 2.0 tools for enhanced language instruction (Parmaxi & Zaphiris, 2017; Wang & Vasquez, 2012). Emerging in the early 2000s, Web 2.0 marked a shift towards user-driven content creation and interactivity (Hew & Cheung, 2013). Unlike traditional websites offering passive consumption, Web 2.0 platforms encourage users to actively contribute content – think social media, where users share thoughts, opinions, and experiences. Additionally, Web 2.0 fosters useful interaction across different platforms due to its compatibility with various devices and systems (Rosen & Nelson, 2008). Popular examples include Wikipedia, Facebook, and blogs. These platforms revolutionized the internet by facilitating user engagement and content creation. The resulting interactive and collaborative nature of Web 2.0 opens a world of possibilities for language learning, encompassing blogs, social networks, wikis, educational games, podcasts, videos, and stories (Rahimi & Fathi, 2022).

Among these tools, WhatsApp, a popular instant messaging application, has emerged as a supplementary medium in educational settings, fostering communication, collaboration, and resource sharing among learners (Tragant et al., 2022).

Web-integrated learning expands learning opportunities, enhances effectiveness, and proves time and cost-efficient (Stubbs et al., 2006). It also nurtures greater self-regulation in learning, a pivotal aspect advocated by self-regulated learning (Zimmerman, 1990). The ability to learn independently, without constant teacher support, significantly impacts academic success (Cleary et al., 2012; Kingsbury et al., 2015). The prevalence of online language learning, especially in response to global shifts towards remote education, has propelled Learning Management Systems (LMS) as foundational platforms for online instruction (Al-Nuaimi & Al-Emran, 2021). These systems offer structured course materials and facilitate educator-learner interactions. However, integrating additional Web 2.0 tools, such as WhatsApp, within this framework presents an opportunity to explore its impact on language proficiency and self-regulated learning strategies among EFL learners (García-Gómez, 2022).

The dynamic landscape of online language learning necessitates continuous exploration of how technology influences student achievement. While research has established a positive correlation between the adept use of digital learning devices and academic outcomes (Lomicka & Lord, 2016; Salvo et al., 2019), a critical gap remains in our understanding of how technology-based interventions can foster the development of self-regulated learning (SRL) skills, a key factor influencing language acquisition (Zimmerman, 2008). This study addresses this gap by investigating the effects of integrating a popular Web 2.0 social network, WhatsApp, into an online EFL learning environment. While past research has explored the benefits of Web 2.0 tools for language learning few studies have examined their specific influence on SRL development within an EFL context. This novel approach sheds light on how readily available technologies like WhatsApp can be leveraged to empower learners, fostering both language acquisition and the development of crucial self-regulatory skills.

The insights gleaned from this research hold significant implications for educators and learners alike. By investigating the combined efficacy of a LMS and WhatsApp, this study aims to provide valuable knowledge on optimizing digital learning environments for effective communication, knowledge sharing, and ultimately, enhanced EFL learning outcomes. Educators can benefit from the findings by gaining insights into how to efficiently deliver online instruction and leverage readily available web-based tools to support student learning. This exploration aims to illuminate **innovative pathways** for harnessing the power of digital tools to foster both language learning and self-regulation skills, paving the way for improved educational experiences for EFL learners worldwide.

Literature Review

Theoretical Framework

The present study is anchored in multifaceted theoretical frameworks that collectively inform the examination of how Web 2.0 technologies, specifically WhatsApp, impact the self-regulated learning (SRL) and language achievement of EFL learners. This theoretical grounding encompasses the realms of self-regulated learning theories, social constructivism, and technology-mediated learning environments. Self-regulated learning theories form the foundational pillar for comprehending how individuals orchestrate, regulate, and govern their learning processes (Zimmerman, 2000). Zimmerman's social cognitive model of self-regulation, a central aspect of this study, accentuates the cyclical nature of SRL processes, involving forethought, performance, and self-reflection phases. This model provides a conceptual framework to scrutinize how learners set objectives, monitor their progress, and adapt strategies to bolster their learning outcomes (Zimmerman, 2002).

Moreover, this study aligns with the fundamental principles of social constructivism, particularly within the framework elucidated by Vygotsky's (1978) sociocultural theory. Vygotsky postulates that learning takes shape within the domain of social interactions and is profoundly influenced by cultural and social contexts (Vygotsky, 1986). This perspective accentuates the significance of collaborative learning, emphasizes knowledge construction through interactive exchanges, and highlights the pivotal role of tools or mediating artifacts,

such as Web 2.0 technologies, in scaffolding learning experiences among learners (Kozulin, 2002).

In delving deeper into the theoretical foundations, Zimmerman's (2000) social cognitive model of self-regulation illuminates the dynamic processes involved in SRL. The cyclical nature of forethought, performance, and self-reflection phases underscores how learners anticipate tasks, execute actions, and reflect on their learning strategies. This theoretical perspective guides the investigation of how EFL learners harness Web 2.0 tools like WhatsApp to set learning goals, monitor their progress, and adapt their strategies to optimize language acquisition and proficiency. Simultaneously, Vygotsky's sociocultural theory posits that learning is inherently social and culturally embedded (Vygotsky, 1986). According to this framework, learners engage in a process of co-construction of knowledge within social interactions, supported by cultural tools and mediating artifacts (Lantolf & Pavlenko, 1995). In the context of this study, it emphasizes how EFL learners leverage WhatsApp, a socially embedded digital platform, as a cultural tool to engage in collaborative learning, share knowledge, and co-construct meaning in their language acquisition journey.

Furthermore, Bruner's (1985) conceptualization of scaffolding elucidates how learning environments, including technology-mediated ones, can support learners' gradual understanding and mastery of new concepts. In the context of this study, WhatsApp functions as a technological scaffold, facilitating interactions, providing access to resources, and enabling peer collaboration, all of which scaffold and support the development of self-regulated learning strategies and language acquisition among EFL learners.

Web 2 Language Learning

In recent years, a great deal of attention has been paid to Web-based learning because of the popularity of Web 2.0 technologies (Ceylan and Kesici, 2017; Fathi et al., 2024; Klein et al., 2021; Kheiri et al., 2019; Salvo et al., 2019). Various studies have illustrated that web-based learning environments develop self-regulated learning and consequently academic achievement. For instance, Cochrane and Bateman (2009) undertook a study on engaging students with Mobile 2.0 and found that mobile-based Web 2.0 had a positive and significant outcome on their achievement and engaged students in a social constructivist learning paradigm. In another study on the use of Web 2.0 in higher education, it was established that wikis, blogs, and KSS could assist learners in collaborating and sharing information, and shape learners' performance (Grosseck, 2009). In addition, Vighnarajah et al. (2009) examined the relationship between online community discussion platforms and self-regulated learning strategies. They found that students' participation in online discussions was effective in developing a self-regulated learning strategy. They asserted that through online discussions, students could seek assistance in practicing self-regulated learning, set their goals, and encourage each other to achieve their goals. Furthermore, Hirata (2011) explored the perceptions of 55 Japanese students toward self-regulated language learning through English language websites. Through an experimental study, the students received a 12-week treatment using resources proposed by language websites to regulate their language learning. The findings showed that web-based learning was influential in cultivating the monitoring, planning, and evaluating skills of the students and consequently the development of self-

regulation in their language learning. Similarly, Hsiao, Tsai, Lin and Lin (2012) examined the relationship between students' self-regulated level and their learning achievement from WebQuest learning scaffolded with self-regulated learning-assisted strategies on 193 sixth-grade language learners. They concluded that integrating self-regulated learning into WebQuest-based language learning could improve the prevalence of self-regulated learning strategies in language learners'' learning attainment. In another study conducted by Mistar and Embi (2016), the impact of WhatsApp as a learning tool on students' language learning was examined on 20 students from Kuala Pilah pre-university. The findings of their study demonstrated that using WhatsApp was significant in helping students learn the language better and develop their English language proficiency. Moreover, in a cross-sectional study in Jordan, Gasaymeh (2017) examined 154 university students' perceptions of the use of WhatsApp regarding its possible integration into their education. Gasaymeh concluded that students tended to integrate WhatsApp into their education because of its simplicity and affordability in their education. Furthermore, the study illustrated that WhatsApp was used for educational purposes such as sharing course-related announcements, sharing links to topics and course-related resources, and seeking assistance from other students.

In the Iranian context, Kheiri et al., (2019) investigated the effect of web-blended instruction on self-regulated learning ability in EFL learners' writings. Moreover, the effects of paper-based feedback and web-assisted feedback on learners' self-regulated learning ability were compared. They determined that a statistically significant difference between the self-regulatory ability in writing tasks of the web-integrated and non-web-integrated instruction groups existed. Learners in the non-web-integrated group underperformed compared with those who received web-integrated instruction in increasing their self-regulatory strategies. However, concerning the type of feedback the groups received, no group outperformed the other in improving their self-regulatory strategies. Although various studies have been conducted on the subject, earlier studies demonstrate some shortcomings. To exemplify, almost all previous research on this subject relied on the effects of social networks on students' academic performance and very limited studies examined the causal effect of social networks on learners' self-regulated learning. Therefore, further investigation of the effect of Web 2.0 social networks on the self-regulated language learning process and learning achievement is required (Hsiao et al., 2012; Lai and Gu, 2011).

The exploration of self-directed learning among EFL learners has received comprehensive attention in diverse settings. Li et al. (2020) delved into examining the relationship between the self-regulation profiles of EFL learners in online settings and their patterns of collaborative learning within reading activities supported by wiki platforms. Mahmoodi et al. (2014) investigated the correlation between self-regulated learning, motivation, and language attainment among EFL learners in Iran, illuminating the pivotal role of SDL in bolstering language skills. Additionally, Kondo et al. (2012) and Şahin Kızıl and Savran (2018) directed their focus on self-regulated learning within the realms of mobile-assisted language learning and vocabulary acquisition via information and communication technologies.

Furthermore, inquiries by Liu et al. (2014) and Liu et al. (2016) yielded insights into the interplay between strategies for self-regulated learning and collaborative practices in online

contexts, highlighting the impact of Web 2.0 technologies on stimulating student involvement and learning dynamics. Additionally, McLoughlin and Lee (2010) presented international instances that showcase innovative instructional methods employing social software to facilitate tailored and self-directed learning in various educational landscapes during the Web 2.0 epoch. These collective investigations underscore the significance of employing self-regulated learning techniques, technology-integrated environments, and collaborative learning methods to advance language acquisition and foster active engagement among EFL students.

Taken together, the extensive array of studies surveyed in the exploration of Web 2.0 in language learning underscores the substantial strides made in understanding the role of technology in enhancing self-regulated learning among EFL students. These studies collectively highlight the potential of Web-based platforms, such as WhatsApp, wikis, and online discussions, in fostering collaborative learning, improving language proficiency, and cultivating self-regulated learning strategies. However, despite this wealth of research, a critical evaluation reveals a notable gap within the existing literature. While prior investigations primarily concentrate on the influence of Web 2.0 technologies on academic performance and the overall learning experience, there remains a scarcity in studies that explicitly delineate the causal relationship between these technologies and the enhancement of learners' self-regulated learning capabilities. This absence poses a significant research gap, necessitating further empirical inquiries that specifically focus on comprehensively examining and validating the role of Web 2.0 tools, particularly WhatsApp, in fostering and augmenting EFL learners' self-regulatory skills within language learning contexts. Addressing this gap can provide substantial insights into the precise mechanisms through which technology interventions facilitate and bolster self-regulated learning among language learners.

Against this backdrop, this study was carried out to enrich the literature on the effect of Web 2.0 on self-regulated language learning and learning achievement. To reach the goals of the study, the following research questions were proposed:

Quantitative phase

1. Does the use of WhatsApp as a supplementary medium to LMS have any significant effects on the language achievement of Iranian EFL learners?
2. Does the use of WhatsApp as a supplementary medium to LMS have any significant effects on the self-regulated learning of Iranian EFL learners?

Qualitative phase

1. What are students' perceptions toward the advantages of online learning using LMS and WhatsApp in learning English?
2. What are students' perceptions toward the disadvantages of online learning using LMS and WhatsApp in learning English?

Method

Participants

The study comprised 24 Iranian junior high school students enrolled at the Iran Language Institute (ILI) in Sanandaj, Iran, encompassing both male and female learners. These participants, aged between 12 and 14 years, were allocated into two coeducational classes, forming distinct experimental and control groups. The students' native language primarily consisted of Kurdish, albeit some individuals also had proficiency in Persian.

For the qualitative phase, data collection involved eight junior high school students (comprising 5 females and 3 males) who were studying English at the Iran Language Institute (ILI) in Sanandaj, Iran. These participants voluntarily engaged in the study, with their ages ranging between 12 and 14 years old. The qualitative exploration was conducted within an online community established through WhatsApp.

Instruments

OPT (Oxford Placement Test)

OPT (Oxford Placement Test) (Allan, 2004) was given to both the experimental and control groups before the pre-test to ensure the levels of the participants were similar to one another in both groups. The version of OPT used in the present study included 40 items, measuring grammar, vocabulary, and reading skills. Using a shorter version of the OPT was due to the participants' proficiency level and the practicality of the test. The test comprised 5 picture recognition vocabularies, 15 vocabulary and grammar questions in the form of three cloze texts (10 vocabulary items and 5 grammar items), and 20 multiple choice questions (15 vocabulary items and 5 grammar items). The reliability of the OPT test was 0.8 and the validity was tested via factor analysis. The OPT demonstrates established reliability, with a Cronbach's alpha coefficient of 0.83 in this study.

SRLLQ (Self-Regulated Language Learning Questionnaire)

SRLLQ (Self-Regulated Language Learning Questionnaire) created and confirmed by Seker (2015) was given to the students before and after the course to evaluate their own self-reported SRL (Self-Regulated Learning). This questionnaire was in agreement with Boekaerts' (1997) Self-Regulated Learning Model and Oxford's (1990) Strategy Inventory for Language Learning (SILL). The questionnaire included 30 items and 5 subcategories of inner motivation (n= 5), exterior motivation (n=4), cognitive strategies (n= 7), metacognitive strategies (n= 10), and evaluation (n= 4). The items were translated to ensure all students clearly understood what was required of them. In this study, the SRLLQ had a Cronbach's alpha coefficient of 0.82, indicating good internal consistency

Pretest

A pre-test was given to both the experimental and control groups before the course to measure students' language proficiency levels regarding the pending course. This test was designed in line with *ILI* (Iran Language Institute) standards and based on the *Test Time* book which includes various proficiency tests relevant to the course. This pre-test included 30 items,

measuring vocabulary, grammar, pronunciation and reading skills. It comprised 10 vocabulary, 10 grammar, 5 pronunciation, and 5 reading comprehension items. All items were MC (multiple choice) and the time limit was thirty minutes. According to *ILI* standards, the reliability of this test was 0.8 and the validity was proven by the aforementioned organization.

Post-test

Post-test was given to both the experimental and control groups after the course to measure students' language proficiency levels concerning the completed course. This test was designed according to *ILI* (Iran Language Institute) standards and based on the *Test Time* book which includes various proficiency tests relevant to the course. This post-test included 30 items, measuring vocabulary, grammar, pronunciation, and reading skills. It comprised 10 vocabulary, 10 grammar, 5 pronunciation, and 5 reading comprehension items. All items were MC (multiple choice) and the time limit was thirty minutes. Based on *ILI* standards, the reliability of this test was 0.8 and the validity was proven by the aforementioned organization. The post-test resembled the pre-test in terms of proficiency levels including a similar number of items, time limit, as well as similar types of required items and skills expected from the respondent students. Thus, comparisons could be made, resulting in appropriate findings and conclusions. In this study, the pre-test and post-test achieved Cronbach's alpha coefficients of 0.79 and 0.81, respectively.

Semi-structured interviews

The qualitative phase of this study relied on semi-structured interviews (see the Appendix) as its primary data collection method. Crafted to directly align with the research inquiries, these interviews were meticulously designed. Individualized and semi-structured, they aimed to extract nuanced insights from participants in relation to the study's specific research questions.

To ensure the credibility and rigor of the interview framework, a meticulous process was undertaken. Initially, the interview questions underwent scrutiny by two seasoned experts in applied linguistics. Additionally, three EFL students participated in a review, offering critical feedback on the questions' phrasing and content. Their invaluable input led to iterative revisions and refinements of the interview protocol, aligning it more closely with the study's objectives.

The interview questions encompassed a spectrum of aspects, probing participants' perspectives on diverse facets such as the efficacy of WhatsApp as a supplementary language learning tool, its influence on language acquisition, its impact on motivating learners, and the multifaceted experiences and drawbacks encountered in online learning. This comprehensive approach aimed to unearth a rich tapestry of insights from the participants, offering a nuanced understanding of their experiences and perceptions regarding WhatsApp's role in the language learning landscape.

To ensure consistency and participant comfort, all interviews were conducted individually in a quiet, private location at the participants' university. The researcher, fluent in both English and Farsi (participants' L1), facilitated the interviews entirely in English. Recognizing the potential for occasional language barriers, participants were offered the flexibility to briefly

use Farsi for clarification purposes. This approach aimed to foster clear communication and encourage more elaborate responses.

A purposive sampling strategy was employed to select ten participants from the experimental group for the interviews. This selection ensured a diverse representation of experiences by including participants with a range of English language proficiency levels. Each interview lasted approximately 45-60 minutes and was audio-recorded with the informed consent of the participants. The recordings were subsequently transcribed verbatim for further analysis.

Procedure

Before commencing data collection, the study ensured compliance with ethical protocols by obtaining necessary permissions from the relevant authorities. Additionally, participants' consent was secured, and strict adherence to confidentiality standards was maintained throughout the study.

The study sample, consisting of two intact classes, underwent division into experimental and control groups. To ensure homogeneity in proficiency levels, the OPT and the Self-Regulated Learning in Learning Questionnaire (SRLLQ) were administered to assess learners' proficiency and self-regulated learning prior to course initiation. Subsequently, both groups underwent a 20-session course spanning three months at the Iran Language Institute (ILI). These sessions occurred twice weekly for ninety minutes via the LMS platform, specifically Big Blue Button.

The experimental group utilized WhatsApp as a supplemental tool alongside LMS, while the control group solely relied on the LMS for course engagement. The experimental group, both within and outside the classroom, engaged in various online and offline assignments facilitated through WhatsApp. Tasks assigned via WhatsApp included listening, speaking, vocabulary, and grammar exercises, aligned with individual student proficiency levels. The teacher provided audio files, images, documents, as well as guidance and instructions regarding task completion via WhatsApp. Furthermore, the teacher used WhatsApp for answering queries, offering feedback, and evaluating students' skills. Conversely, the control group exclusively interacted through the LMS, given the restrictions posed by the COVID-19 pandemic.

Following the course, both groups underwent a post-test, with the experimental group completing an additional SRLLQ assessment to gauge the course's effectiveness. Persian translations accompanied each item in the SRLLQ to ensure clarity and comprehension. Data from pre-tests and post-tests were analyzed using the SPSS software.

In the qualitative phase, individual semi-structured interviews were conducted with eight English language learners through the WhatsApp application. These interviews, conducted in Persian to facilitate participants' expression, aimed to delve into their experiences with online learning, specifically exploring their perceptions regarding the advantages and disadvantages of using LMS and WhatsApp for online classes. Each interview, lasting between 15 to 25 minutes, focused on eliciting comprehensive insights into the learners' perspectives. The

interviews continued until saturation was reached, where further data collection yielded repetitive information rather than contributing new insights (Ary et al., 2006). Participants were briefed on the interview's objectives before commencement to ensure informed participation.

Data Analysis

Statistical analysis commenced with the application of the Kolmogrov-Smirnov test to ensure data adhered to a normal distribution. Descriptive statistics, including standard deviation (SD), mean, and standard error of the mean, were calculated to assess students' participation in both the pre-test and post-test phases. Furthermore, an independent-sample t-test was employed to ascertain whether the integration of WhatsApp as a supplementary medium to LMS significantly impacted the language achievement and self-regulation of Iranian EFL students.

The qualitative aspect of the study utilized content analysis as the method for analyzing data collected through semi-structured interviews. Initially, interview notes were transcribed, and a meticulous line-by-line review of all text was conducted. Repeated concepts and recurring phrases were systematically identified and grouped together based on their similarity. The analytical framework drew from Strauss and Corbin's (1998) coding analysis, involving a multi-step approach. Firstly, data underwent open coding to categorize content into major thematic groups. Subsequently, axial coding was applied to unveil interconnections and relationships among these categories. Finally, selective coding was employed to refine and integrate emerging theoretical frameworks, aimed at evolving a comprehensive understanding of the data (Strauss and Corbin, 1998, 161).

Results

Quantitative Results

Prior to conducting inferential statistical analyses, the assumptions underlying the independent-samples t-test employed in this study were meticulously addressed. Normality of data distribution, a crucial assumption for the t-test, was assessed using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test results indicated normality of distribution for both language achievement scores ($p = 0.087$) and self-regulation scores ($p = 0.124$). These non-significant p-values (greater than 0.05) suggest that the data distribution for both variables can be reasonably assumed to be normal.

Results of OPT

As mentioned before, to ensure the homogeneity of the students concerning their English language proficiency, an OPT test was administered to the students. An independent-sample t-test was carried out to compare the OPT scores for the experimental and control groups. As indicated in Table 1, the results did not demonstrate a statistically significant difference in the OPT scores for the experimental ($M = 15.41$, $SD = 4.75$) and control groups ($M = 16.50$, $SD = 5.7$); $t\ (22) = -.505$, $p > 0.05$), emphasizing that the two groups were of similar levels of general English proficiency before experimenting.

Table 1. *Results of the OPT for Each Group*

Groups	M (SD)	T	Sig.
Experimental	15.41 (4.75)	-.505	.619
Control	16.50 (5.7)		

Addressing the Research Questions

Before addressing the two research questions of the quantitative phase, the descriptive statistics for pre-tests and post-tests of both variables were calculated using SPSS, version 21. Table 2 presents the descriptive statistics and demonstrates that the mean scores of both variables were increased from the pre-test to the post-test. However, to confirm the validity of these statistical changes, inferential statistics needed to be taken into consideration.

Table 2. *Descriptive Statistics for Pre- and Post-test Scores*

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pre-achievement	Experimental	12	18.2500	4.11483	1.18785
	Control	12	19.4167	5.33357	1.53967
Post-achievement	Experimental	12	23.3333	3.44656	.99494
	Control	12	20.0833	4.12219	1.18997
Pre-regulation	Experimental	12	13.9583	3.67088	1.05969
	Control	12	14.9167	3.52803	1.01845
Post-regulation	Experimental	12	21.1667	3.78594	1.09291
	Control	12	17.1667	4.08063	1.17798

The normality of data was investigated in the first step of the inferential statistics investigation. A one-sample Kolmogorov-Smirnov (K-S) test was conducted on both pre-test and post-test scores to confirm the normality assumption. If the significance level is larger than .05 in a one-sample Kolmogorov-Smirnov (K-S) test, it demonstrates that the data is normally distributed. The results of the one-sample K-S test revealed that the data was normally distributed. However, the data for OPT, pre-test of language achievement, and pre-test of self-regulated language learning were not normally distributed. However, as the sample size was small (N=24), it did not affect the results if parametric tests were used.

To answer the first research question and investigate whether the use of WhatsApp as a supplementary medium to LMS had any significant effects on the language achievement of Iranian EFL learners, ANCOVA was performed. The scores on the pre-test were considered as a covariate to 'control' for pre-existing differences between the groups.

As can be observed in Table 2, the language achievement mean score of the experimental group was 18.25 as measured by the pretest which increased to 23.33 in the language achievement in the post-test. Similarly, the mean score of language achievement in the pre-test for the control group was 19.41, which increased to 20.08 in the post-test. As a result, it appears that both types of instruction significantly contributed to enhancing the language achievement of the participants in the two groups.

To identify which group had experienced a greater gain, ANCOVA was carried out. For ANCOVA analysis, the type of instruction (i.e., WhatsApp-based or traditional) was the independent variable, and the scores on the language achievement after the completion of the study were the dependent variables. Students' scores on the pre-tests were considered as the covariate in this analysis. Additionally, preliminary checks were performed for the conducted ANCOVAs, to ensure that violation of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate did not occur.

After adjustment for the pretest scores of the language achievement, a statistically significant difference was observed between the two groups on post-test scores of the language achievement ($F_{(1, 21)} = 6.41$, $p = 0.019$, partial eta squared = 0.234) (see Table 3). This finding indicated that the participants in the experimental group improved their language achievement more significantly than the participants in the control group. This suggests that the use of WhatsApp as a supplementary medium to LMS significantly improved the language achievement of Iranian EFL learners.

Table 3. *The Results of ANCOVA for Language Achievement Scores*

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	123.044[a]	2	61.522	5.009	.017	.323
Intercept	307.008	1	307.008	24.997	.000	.543
Pre-achievement	59.669	1	59.669	4.858	.039	.188
Group	78.793	1	78.793	6.416	.019	.234
Error	257.914	21	12.282			
Total	11691.000	24				
Corrected Total	380.958	23				

The second research question was concerned with whether the use of WhatsApp as a supplementary medium to LMS had any significant effects on the self-regulated learning of Iranian EFL learners. As observed in Table 2, the mean score of the experimental group for self-regulated learning was 13.95 in the pre-test and increased to 21.16 in the post-test of self-regulated learning. Similarly, the self-regulated learning mean score for the control group was 14.91 in the pre-test and increased to 17.16 in the post-test. Therefore, it appears that both interventions contributed to improving participants' self-regulated learning.

As the inferential statistics of the second research question indicate, another One-Way ANCOVA was carried out on the scores of self-regulated learning to investigate the impacts of the two types of interventions on the self-regulated learning of the participants. The preliminary checks were performed to make certain that no breach of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate occurred. The results of the ANCOVA analysis (see Table 4) employing the General Linear Modeling technique in SPSS revealed that there was a statistically significant difference between the two groups on post-test scores of self-regulated learning ($F_{(1, 21)} = 39.373$, $p =$

0.000, partial eta squared = 0.652). This finding revealed that the use of WhatsApp as a supplementary medium to LMS significantly enhanced the self-regulated learning of Iranian EFL learners.

Table 4. *The Results of ANCOVA on Self-Regulated Language Learning*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	360.733[a]	2	180.367	49.773	.000	.826
Intercept	35.747	1	35.747	9.864	.005	.320
Pre-R-regulation	264.733	1	264.733	73.054	.000	.777
Group	142.682	1	142.682	39.373	.000	.652
Error	76.100	21	3.624			
Total	9253.500	24				
Corrected Total	436.833	23				

Qualitative Results

This section elaborates on the findings of the qualitative phase of the study. The findings are based on the responses to the following research questions: 1) What are the students' perceptions toward the advantages of online learning using LMS and WhatsApp? 2) What are the students' perceptions toward the disadvantages of online learning using LMS and WhatsApp?

The advantages of the use of LMS and WhatsApp

Feasibility and User-Friendliness

The participants unanimously recognized WhatsApp as a pivotal tool for effective teaching and learning. They emphasized its cost-free nature, intuitive interface, and its prowess in establishing seamless connections between educators and students. Here are some sentiments expressed by the participants:

> *WhatsApp is user-friendly and fosters effortless communication. The teacher can easily share resources, and we can discuss lessons or problems.*
>
> *It's a simple platform that promotes independent learning and is accessible to everyone in their daily lives*
>
> *The best thing about WhatsApp is its ubiquitous accessibility, making it easy for both students and teachers to access anytime, anywhere.*

Skill Development

Learners perceived WhatsApp as a catalyst for enhancing English language skills. By accessing diverse learning resources shared by teachers, participants reported improvements in listening comprehension and speaking proficiency:

> *Assigned listening exercises on platforms like 'Listen A Minute' resulted in improved comprehension within our group.*

Our speaking skills were honed through video discussions led by our teacher.

Convenient Learning

The participants lauded the convenience offered by WhatsApp, enabling learning from any location. This flexibility resonated with their lifestyle, allowing them to integrate learning seamlessly into various contexts:

The flexibility of learning on WhatsApp allows us to study while socializing with friends or from the comfort of home.

Learning on WhatsApp eliminates the need to go out; we can study from home at our convenience.

Immediate Feedback

The participants also emphasized WhatsApp's real-time feedback mechanism as instrumental in swiftly addressing their learning queries, enabling quick problem-solving and enhancing the learning process:

The teacher's prompt responses on WhatsApp helped clarify doubts and facilitated our learning.

Group discussions aided in solving problems, providing immediate clarification when needed.

Enhanced Communication

Learners highlighted the value of LMS and WhatsApp in fostering closer relationships with both peers and instructors, fostering an environment of intimacy and support:

Engaging via LMS and WhatsApp allowed for closer interactions with our teacher, fostering stronger relationships and support.

The Disadvantages of LMS and WhatsApp for Online Learning

Reduced Motivation

Notably, some participants reported feeling demotivated during online learning sessions due to ineffective explanations via LMS and WhatsApp. Confusing explanations led to disinterest and comprehension difficulties:

Explanations on LMS were challenging to understand, leading to decreased motivation.

The short, unclear explanations made it difficult to grasp the material, and there wasn't enough support for clarification.

Passive Learning and Lack of Engagement

The participants also observed that learning via WhatsApp might lead to passive learning behavior, hindering active participation. This passivity might pose challenges in evaluating students' needs and understanding levels:

> *WhatsApp learning tends to encourage passive learning, limiting active participation within groups.*

Network Connectivity Issues

Technical glitches, particularly poor internet connectivity, emerged as a significant impediment to effective online learning, especially for students in rural areas:

> *Frequent bad internet connectivity affected the timely submission of assignments and caused stress.*

Lack of Focus and Distractions

Also, the participants highlighted the challenge of maintaining focus during online sessions due to home-based distractions and the tendency of peers to engage in unrelated activities:

> *Home distractions and classmates not paying attention during online sessions led to a lack of concentration.*

> *Some students engaged in other activities during sessions, resulting in distractions and reduced focus.*

Overall, the qualitative phase provided multifaceted insights into the nuanced experiences of students regarding the advantages and disadvantages of using LMS and WhatsApp for online language learning. While these platforms were praised for their user-friendliness, skill enhancement opportunities, convenience, and fostering closer relationships, challenges related to decreased motivation, passive learning, technical issues, and distractions during online sessions were notable. These findings underscore the necessity of mitigating technological challenges and enhancing student engagement to optimize online language learning environments.

Discussion

The study was conducted to investigate the impact of online learning on language achievement and self-regulated learning of Iranian EFL learners through an online Learning Management System (LMS) and WhatsApp as a supplementary medium in the experimental group. A significant effect was observed concerning the first research question which queried whether the use of WhatsApp as a supplementary medium to LMS had any significant effects on the language achievement of Iranian EFL learners. The use of WhatsApp aligns with social constructivist learning theory, which emphasizes collaborative and interactive learning. WhatsApp's platform facilitates peer interaction, allowing learners to engage in meaningful discussions, share resources, and provide instant feedback. The collaborative nature of the application can foster a supportive learning environment, leading to improved language acquisition (Vygotsky, 1978).

In addition, WhatsApp provides learners with informal learning opportunities beyond the structured environment of an LMS. Studies (e.g., Hsu, 2019; Godwin-Jones, 2017) have highlighted the significance of informal learning in language acquisition, suggesting that platforms like WhatsApp, due to their informal nature, promote authentic language use,

colloquial expressions, and cultural immersion, all of which contribute to language proficiency. The exiting literature emphasizes the role of motivation and engagement in language learning outcomes (Dörnyei, 2001). WhatsApp's user-friendly interface, multimedia features, and real-time communication aspects can heighten learners' motivation and engagement. The immediacy of interactions and the ability to connect with peers outside formal class hours may contribute positively to sustained interest and commitment to language learning. Also, while LMS platforms offer structured content and formal learning materials, WhatsApp complements these systems by catering to diverse learning styles (Gikas & Grant, 2013). Learners with different preferences—visual, auditory, kinesthetic—can benefit from WhatsApp's multimedia capabilities, enabling a more personalized learning experience.

Several studies support the findings of this research, highlighting WhatsApp's effectiveness in boosting EFL student achievement (Ahmad & Al-Khanjari, 2011). This aligns with research by Finkbeiner (2001) and Najmi (2015) suggesting students naturally gravitate towards technology, particularly WhatsApp, for language learning, ultimately leading to improved language competence. Furthermore, integrating WhatsApp instruction within a LMS has been shown to enhance student motivation to improve their language skills. This translates to higher levels of learner performance, as evidenced by Kamalian & Sayadian (2014) and Radia (2019). The present research findings confirm previous research findings such as those of Patil et al. (2015) on the significance of the use of WhatsApp for study-related issues in developing academic performance. Several previous studies have also highlighted the relationships between the digital learning environment and academic achievement (Ceylan and Kesici, 2017; Klein et al., 2021; Liu et al., 2024). However, the current study findings are in contrast with the results of the study by Munkaila and Iddrisu (2015) in which they observed that there was a negative relationship between social media and the academic performance of students with 39.5% of the students reporting that WhatsApp had an adverse effect on their academic performance. Littlejohn et al.'s study (2010) contradicted the present study results as they concluded that despite students' knowledge of using technology, they did not demonstrate effective use of technology to support their learning process.

The findings also illustrated that WhatsApp as a supplementary medium to LMS meaningfully influenced the self-regulated learning of Iranian EFL students which was the concern of the second research question. Self-regulated learning involves learners' ability to control and regulate their own cognitive processes, motivation, and behavior in the pursuit of learning goals (Zimmerman, 2000). WhatsApp's supplementary role in this context can be discussed by considering its facilitation of various SRL components such as goal setting, monitoring, strategy use, and self-reflection (Pintrich, 2000). The platform's asynchronous and synchronous features enable learners to set study goals, share resources, monitor progress, and engage in reflective discussions.

The use of WhatsApp aligns with social-cognitive theories, emphasizing the importance of social interactions in learning (Bandura, 1986). By allowing learners to interact with peers and instructors, share experiences, and collaboratively problem-solve, WhatsApp supports the social aspect of learning, which is known to be integral to self-regulated learning processes

(Zimmerman, 2000). The social nature of WhatsApp may promote a sense of community and collective responsibility for learning outcomes among learners.

Also, the integration of WhatsApp into the learning process represents a form of technology-enhanced self-regulation. The platform's versatility in multimedia sharing, instant communication, and accessibility potentially aids learners in employing various self-regulation strategies such as metacognitive monitoring, cognitive strategies, and motivational regulation (Efklides, 2011). For instance, learners might use WhatsApp to discuss effective learning strategies or seek clarification on concepts, thereby promoting metacognition. Self-regulated learners exhibit high levels of motivation and engagement (Zimmerman, 2000). WhatsApp's interactive and dynamic nature can contribute to sustained motivation through social interactions, peer support, and timely feedback (Cleary et al. 2012). The platform's user-friendly interface and real-time communication may foster a positive learning environment that encourages active participation and engagement.

This finding is in accordance with the findings of Barber et al. (2011) who concluded that technology might assist learners to manage their educational progress. In addition, they found that using technology lessened learners' fatigue, and using technology increased students' self-regulated learning. Furthermore, Dettori and Perscio's study (2008) indicated a meaningful improvement in students' self-regulated learning in terms of technology use in their instruction. In a similar vein, various studies have found a relationship between the digital learning environment and self-regulated learning (Dabbagh and Kitsantas, 2005; Johnson and Davies, 2014; Yot-Domínguez and Marcelo, 2017). Reports from different countries including the UK (see Bryant, 2007), the USA (see Salaway, Caruso, and Nelson, 2008), and Australia (see Fitzgerald and Steele, 2008) established that the integration of digital learning into learning design could make a qualitative difference in giving students' sense of ownership, aiding them in monitoring their learning and career planning. However, the findings are in contrast with the results of a study conducted by Yot-Domínguez and Marcelo (2017) on 711 university students in Spain which found that university students, even when they are frequent users of digital technology, do not tend to use these technologies to regulate their own learning process. Since the relationship between SRL and academic achievement has been discussed by different researchers (Ceylan and Kesici, 2017; Dent and Koenka, 2016; Wolters and Hussain, 2015), it can be concluded that the academic achievement of learners can be maintained by developing their self-regulated learning as a result of the integration of web-based instruction to promote learners` independency to learn. Therefore, the optimization of the digital learning environment can support the role of SRL in increasing academic achievement under normal or pandemic conditions.

The findings of the qualitative phase of the study demonstrated both the advantages and disadvantages of using WhatsApp and LMS for students. The advantages of using WhatsApp and LMS in the study included feasibility, improving several skills, the convenience of learning, providing immediate teacher feedback, and making social networks through LMS and WhatsApp. The qualitative findings regarding the benefits of integrating LMS and WhatsApp for learning English, align with existing literature on technology integration in education (Kartal, 2022; Wang & Vasquez, 2012; Weissheimer et al., 2018; Yulia, 2020). The

participants appreciated WhatsApp's user-friendly interface and accessibility, endorsing its role in facilitating effective teacher-student communication (Kirkwood & Price, 2014).

They acknowledged WhatsApp's contribution to skill development, consistent with literature emphasizing online platforms' role in fostering language skills (Hidayat, 2020; Lai et al., 2016) and supported the flexible learning environment advocated in blended learning models (Hao et al., 2021; Ibrahim Abbas, 2017). The platform's anytime, anywhere learning capability aligns with modern flexible learning environments enabled by technology (Yu & Trainin, 2022). The participants also valued WhatsApp's immediate feedback, echoing its pedagogical significance in enhancing learning outcomes (García-Gómez, 2022) and recognized its role in nurturing closer relationships, in line with studies emphasizing social presence and instructor-student rapport in online learning (Flanigan et al., 2022).

However, drawbacks emerged. The students reported decreased motivation due to unclear explanations on LMS and WhatsApp, echoing concerns about poorly structured online content (Wicaksono et al., 2023). Perceived risks of passive learning aligned with the importance of fostering active engagement in online environments (Kebritchi et al., 2017), while complaints about network connectivity resonated with concerns about technological infrastructure for successful online learning (Palvia et al., 2018). The reported lack of focus due to home-based distractions reflected challenges in maintaining student attention during online sessions (Gillett-Swan, 2017).

These disadvantages support the study of Ma'ruf, Fadilah, and Akmal (2019) who identified the benefits and drawbacks of using WhatsApp in paragraph writing classes, highlighting advantages like peer review, flexible timing, perceived vocabulary progress, and grammatical improvement. They also noted limitations such as unreliable and costly internet connections. Similarly, Agung et al. (2020) investigated 66 English language students' perceptions during the COVID-19 pandemic, revealing significant obstacles in online learning: internet availability and sustainability, accessibility of teaching media, and tool compatibility. These findings corroborate the current study's identification of disadvantages in using WhatsApp and LMS for learning English. Also, Nurul Laili and Nashir's (2021) study affirmed the flexibility of online learning but also highlighted limitations, including unstable signals, reduced student motivation, difficulties in conversation practice, and high internet costs. Notably, their conclusion showed a preference for face-to-face learning among the majority (91%) of students.

Conclusions and Implications

The research sought to investigate the impact of WhatsApp as a supplementary medium to traditional Learning Management System (LMS) classrooms on the language achievement and self-regulated learning of Iranian EFL learners. The findings affirm that integrating WhatsApp alongside LMS significantly influenced Iranian EFL learners' language achievement. This positive outcome was linked to students' favorable attitudes towards WhatsApp, its ease of use, and the learners' motivation and autonomy in leveraging this globally popular application (Kamalian & Sayadian, 2014; Najmi, 2015). Furthermore, the study revealed a noteworthy effect of using WhatsApp in conjunction with LMS on enhancing self-regulated learning

among Iranian EFL learners by enabling them to monitor their progress throughout the course via WhatsApp. The qualitative phase unveiled both advantages and drawbacks associated with using WhatsApp and LMS among students. While the benefits included feasibility, skill enhancement, learning convenience, immediate teacher feedback, and the establishment of social networks through LMS and WhatsApp, some participants expressed concerns regarding potential drawbacks such as decreased interest in learning, connectivity issues, and lapses in concentration.

In light of these findings, there is a clear call for modifications within the Iranian educational system to facilitate more efficient utilization of WhatsApp alongside LMS by both students and teachers. Notably, learners from both groups exhibited a positive reception toward technology, particularly WhatsApp in conjunction with LMS. Building upon these results, it is recommended that EFL instructors integrate WhatsApp into their teaching methodologies, whether alongside LMS or within traditional face-to-face classes, to bolster self-regulation and language achievement among learners. Additionally, EFL students can leverage WhatsApp to enhance the convenience and efficacy of their self-regulated learning. Curriculum developers should consider aligning materials with virtual and remote English language classes. Teachers can foster learning environments conducive to independent and self-regulated learning, enabling learners to seek challenges, reflect on their progress, and take ownership of their accomplishments (Paris & Paris, 2001).

This study's findings offer valuable insights that can inform pedagogical practices and potentially influence policy decisions within the Iranian EFL educational landscape. Notably, both experimental and control groups exhibited a positive disposition towards technology integration, particularly the combined use of WhatsApp and a Learning Management System (LMS). Building upon this positive reception, EFL instructors are encouraged to consider integrating WhatsApp into their teaching methodologies. This integration can occur alongside existing LMS platforms or directly within traditional face-to-face classes. By embracing this approach, instructors have the potential to foster self-regulated learning skills and enhance language acquisition among their students.

For EFL learners themselves, strategically leveraging WhatsApp presents a compelling opportunity to significantly improve the convenience and effectiveness of their self-directed learning endeavors. Curriculum developers can further optimize learning by aligning curriculum materials with the unique needs of virtual and remote English language learning environments, particularly when used in conjunction with technology-based instruction. Ultimately, fostering learning environments that cultivate independent and self-regulated learning practices remains paramount for educators. This aligns with the work of Paris & Paris (2001), who emphasize the importance of creating classrooms where students are empowered to actively seek challenges, reflect on their progress, and take ownership of their learning achievements.

However, the study faced limitations such as the small sample size of 24 participants divided into two classes, determined by the organization's structure, preventing random participant allocation. Consequently, the samples might not accurately represent the entire population. Additionally, the study lacked control over external variables like students' social or cultural

backgrounds. Participation was limited to learners from a specific institute, potentially limiting the study's generalizability to all Iranian English learners. Future research should encompass larger and more diverse student samples across various age groups and proficiency levels in different English language learning settings. Exploring WhatsApp's impact on EFL students' personal characteristics like self-esteem, self-realization, self-effectiveness, self-conception, and tendencies could be a worthwhile avenue for future studies.

This study, while offering valuable insights into the effects of WhatsApp integration on EFL learning, is not without limitations. The relatively small sample size of 24 participants, divided into two classes due to the organizational structure, restricted the ability to randomly allocate participants. Consequently, the generalizability of the findings to the wider population of Iranian EFL learners might be limited. Additionally, the study design did not control for external variables such as students' social or cultural backgrounds. Furthermore, participation being limited to learners from a specific institute potentially restricts the applicability of the results to all Iranian EFL contexts.

Future research efforts can address these limitations by employing larger and more diverse student samples representing various age groups, proficiency levels, and English language learning settings. This would enhance the generalizability of the findings and provide a more comprehensive picture of WhatsApp's impact on a broader EFL learner population. Additionally, investigating the influence of WhatsApp integration on EFL students' personal characteristics like self-esteem, self-realization, self-efficacy, self-conception, and learning tendencies could be a fruitful avenue for future studies. Exploring these personal dimensions alongside academic achievement could provide a richer understanding of how WhatsApp shapes the overall learning experience for EFL learners.

References

Agung, A. S.S. N., Surtikanti, M. W., & a.

Ahmad, N., & Al-Khanjari, Z. (2011). Effect of Moodle on learning: An Oman perception. *International Journal of Digital Information and Wireless Communications,* 1(4), 746-752.

Ahmad, A. S., & Hamad, K. Y. (2020). Technology Integration in Teaching: A Study that Examines How Technology Integration Affects Student Achievement. *Journal of Education and Culture Studies*, 4(3), 44-52. http://dx.doi.org/10.22158/jecs.v4n3p44

Allan, D. (2004). *Oxford Placement Test.* Oxford University Press.

Al-Nuaimi, M. N., & Al-Emran, M. (2021). Learning management systems and technology acceptance models: A systematic review. *Education and Information Technologies*, 26(5), 5499-5533. http://dx.doi.org/10.1007/s10639-021-10513-3

Ary, D., Jacobs, L. C., Razavieh, A., & Sorensen, C. (2006). *Introduction to research in education (7th ed.).* Belmont, Thomson Wadsworth.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.

Barber, L. K., Bagsby, P. G., Grawitch, M. J., & Buerck, J. P. (2011). Facilitating self-regulated learning with technology: Evidence for student motivation and exam improvement. *Teaching of Psychology*, 38(4), 303–308. http://dx.doi.org/10.1177/0098628311421337

Donnermann, M., Lein, M., Messingschlager, T., Riedmann, A., Schaper, P., Steinhaeusser, S., & Lugrin, B. (2021). Social robots and gamification for technology supported learning: An empirical study on engagement and motivation. *Computers in Human Behavior*, 121, 106792. http://dx.doi.org/10.1016/j.chb.2021.106792

Bosco, J. (2009). *Web 2.0 in schools: Status, issues, prospects.* Redefining Teacher Education in a Digital Age.

Bruner, J. (1985). The role of interaction formats in language acquisition. In *Language and social situations* (pp. 31-46). Springer New York.

Bryant, L. (2007). Emerging trends in social software for education. In *Emerging technologies for learning* (Vol. 2, pp. 10-18). Coventry, UK: Becta. http://partners.becta.org.uk/page_documents/research/emerging_technologies07_chapter1.pdf

Dabbagh, N., & Kitsantas, A. (2005). Using web-based pedagogical tools as scaffolds for self-regulated learning. *Instructional Science*, 33(5), 513–540. https://doi.org/10.1007/s11251-005-1278-3.

Dent, A. L., & Koenka, A. C. (2016). The relation between self-regulated learning and academic achievement across childhood and adolescence: A meta-analysis. *Educational Psychology Review*, 28(3), 425–474. https://doi.org/10.1007/s10648-015-9320-8.

Ceylan, V. K., & Kesici, A. E. (2017). Effect of blended learning on academic achievement. *Journal of Human Sciences*, 14(1), 308–320. https://www.jhumansciences.com/ojs/index.php/IJHS/article/view/4141.

Cleary, T. J., Callan, G. L., & Zimmerman, B. J. (2012). Assessing self-regulation as a cyclical, context-specific phenomenon: Overview and analysis of SRL microanalytic protocols. *Education Research International*, 2012(1), 1-19 428639. http://dx.doi.org/10.1155/2012/428639

Cochrane T. F. I., & Bateman R. (2009). Facilitating social constructivist learning environments for product design students using social software (web2) and wireless mobile devices DESIGN Principles and Practices: *An International Journal,* 3(1), 67-88. http://dx.doi.org/10.3402/rlt.v18i3.10766

Dettori, G. & Persico, D. (2008). Detecting self-regulated learning in online communities by means of interaction analysis. *IEEE Transactions on Learning Technologies*, 1(1), 11-19. http://dx.doi.org/10.1109/TLT.2008.7

Dörnyei, Z. (2001). *Motivational strategies in the language classroom*. Cambridge University Press.

Efklides, A. (2011). Interactions of metacognition with motivation and affect in self-regulated learning: The MASRL model. *Educational Psychologist*, 46(1), 6-25. http://dx.doi.org/10.1080/00461520.2011.538645

Fahmi Bataineh, R., & Barjas Mayyas, M. (2017). The utility of blended learning in EFL reading and grammar: A case for Moodle. *Teaching English with Technology,* 17(3), 35-49.

Fathi, J., & Rahimi, M. (2022). Examining the impact of flipped classroom on writing complexity, accuracy, and fluency: A case of EFL students. *Computer Assisted Language Learning*, 35(7), 1668-1706. http://dx.doi.org/10.1080/09588221.2020.1825097

Fathi, J., Rahimi, M., & Derakhshan, A. (2024). Improving EFL learners' speaking skills and willingness to communicate via artificial intelligence-mediated interactions. *System*, 121, 103254. http://dx.doi.org/10.1016/j.system.2024.103254

Finkbeiner, C. (2001). One and all in CALL? Learner-moderator-researcher. *Computer Assisted Language Learning,* 14(3-4), 339-361. http://dx.doi.org/10.1076/call.14.3.339.5793

Fitzgerald, R. & Steele, J. (2008). *Digital Learning Communities (DLC): Investigating the application of social software to support networked learning (CG6-36).* Sydney: Australian Learning and Teaching council. http://www.altc.edu.au/system/files/resources/grants_cg_report_dlc_uc_feb09.pdf.

Flanigan, A. E., Akcaoglu, M., & Ray, E. (2022). Initiating and maintaining student-instructor rapport in online classes. *The Internet and Higher Education,* 53, 100844. http://dx.doi.org/10.3102/1880972

García-Gómez, A. (2022). Learning through WhatsApp: Students' beliefs, L2 pragmatic development and interpersonal relationships. *Computer Assisted Language Learning*, 35(5-6), 1310-1328. http://dx.doi.org/10.1080/09588221.2020.1799822

Gasaymeh, A. M. (2017). University Students' use of WhatsApp and their Perceptions Regarding its Possible Integration into their Education. *Global Journal of Computer Science and Technology: G Interdisciplinary,* 17 (1), 1-9. http://dx.doi.org/10.24256/itj.v5i1.2584

Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education,* 19, 18-26. http://dx.doi.org/10.1016/j.iheduc.2013.06.002

Gillett-Swan, J. (2017). The challenges of online learning: Supporting and engaging the isolated learner. *Journal of Learning Design*, 10(1), 20-30. http://dx.doi.org/10.5204/jld.v9i3.293

Godwin-Jones, R. (2017). Global reach, local power: Exploring literacy on WeChat. *Language Learning & Technology,* 21(2), 1–11.

Grosseck, G. (2009). To use or not to use web 2.0 in higher education? *Procedia - Social and Behavioral Sciences,* 1 (1), 478-482 https://doi.org/10.1016/j.sbspro.2009.01.087.

Hadwin, A. F., Järvelä, S., & Miller, M. (2011). Self-regulated, co-regulated, and socially shared regulation of learning. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 65-84). Routledge.

Hao, T., Wang, Z., & Ardasheva, Y. (2021). Technology-assisted vocabulary learning for EFL learners: A meta-analysis. *Journal of Research on Educational Effectiveness*, 14(3), 645-667.

Hew, K. F., & Cheung, W. S. (2013). Use of Web 2.0 technologies in K-12 and higher education: The search for evidence-based practice. *Educational Research Review*, 9, 47-64. http://dx.doi.org/10.1016/j.edurev.2012.08.001

Hidayat, A. (2020). Students' Perceptions of E-learning During Covid-19 Pandemic. *MATHEMA Journal,* 2(2), 34–45

Hirata, Y. (2011). Evaluating web content for self-directed language learning. In G. Dettori, & D. Persico (Eds.), *fostering self-regulated learning through ICT* (pp. 179–193). New York: Information Science Reference.

Hsiao, H. S., Tsai, C. C., Lin, C. Y., & Lin, C. C. (2012). Implementing a self-regulated WebQuest learning system for Chinese elementary schools. *Australasian Journal of Educational Technology,* 28(2), 315–340. https://doi.org/10.14742/ajet.876

Hsu, L. (2019). The use of mobile instant messaging to facilitate EFL learners' autonomous vocabulary learning. *Computer Assisted Language Learning,* 32(5-6), 494-520.

Hwang, G. J., Rahimi, M., & Fathi, J. (2024). Enhancing EFL learners' speaking skills, foreign language enjoyment, and language-specific grit utilising the affordances of a MALL app: A microgenetic perspective. *Computers & Education*, 105015.

Ibrahim Abbas, Z. (2017). Blended learning and student satisfaction: An investigation into an EAP writing course. *Advances in Language and Literary Studies,* 9(1), 102–105.

Johnson, G., & Davies, S. (2014). Self-regulated learning in digital environments: Theory, research, praxis. *British Journal of Research,* 1(2), 1–14.

Kartal, G. (2022). Evaluating a mobile instant messaging tool for efficient large-class speaking instruction. *Computer Assisted Language Learning*, 1-29. http://dx.doi.org/10.1080/09588221.2022.2074463

Kamalian, A. and Sayadian, S. (2014). The role of short text messaging in Iranian EFL vocabulary learning and motivation. *Science,* 2(4), 101-107. http://dx.doi.org/10.11648/j.sjedu.20140204.12

Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems*, 46(1), 4-29. http://dx.doi.org/10.1177/0047239516661713

Kenning, M.M. (2007). *ICT and Language Learning*. From Print to the Mobile Phone, Palgrave Macmillan,

Kheiri, S., Soleimani, H., Jafarigohar, M., & Rostami Abu Saeedi, A. A. (2019). The effect of Web-integrated instruction and feedback on self-regulated learning ability of Iranian EFL learners. *Iranian Journal of English for Academic Purposes,* 8*(*1), 35-48.

Kingsbury, M. H., Fry, S. Ketteridge, & S. Marshal (Eds.). (2015). Encouraging independent learning. A handbook for teaching and learning in higher education: Enhancing academic practice, (pp. 169– 179). Routledge.

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology*, 39(1), 6-36. http://dx.doi.org/10.1080/17439884.2013.770404

Kitsantas, A., & Dabbagh, N. (2010). Learning to learn with Integrative Learning Technologies (ILT): A practical guide for academic success. Greenwich, CT: Information Age Publishing.

Klein, P., Ivanjek, L., Dahlkemper, M. N., Jeličić, K., Geyer, M. A., Küchemann, S., & Susac, A. (2021). Studying physics during the COVID-19 pandemic: Student assessments of learning achievement, perceived effectiveness of online recitations, and online laboratories. *Physical Review Physics Education Research,* 17(1), 1-11.

Kondo, M., Ishikawa, Y., Smith, C., Sakamoto, K., Shimomura, H., & Wada, N. (2012). Mobile assisted language learning in university EFL courses in Japan: Developing attitudes and skills for self-regulated learning. *ReCALL*, 24(2), 169-187. https://journal.uniku.ac.id/index.php/ERJEE

Kozulin, A. (2002). Sociocultural theory and the mediated learning experience. *School Psychology International*, 23(1), 7-35. http://dx.doi.org/10.1177/0143034302023001729

Lai, C., & Gu, M. (2011). Self-regulated out-of-class language learning with technology. *Computer Assisted Language Learning*, 24*(*4), 317–335. http://dx.doi.org/10.1080/09588221.2011.568417

Lai, C., Shum, M., & Tian, Y. (2016). Enhancing learners' self-directed use of technology for language learning: the effectiveness of an online training platform. *Computer Assisted Language Learning*, 29(1), 40-60. http://dx.doi.org/10.1080/09588221.2014.889714

Lantolf, J. P., & Pavlenko, A. (1995). Sociocultural theory and second language acquisition. *Annual Review of Applied Linguistics*, 15, 108-124.

Lee, S. M. (2022). A systematic review of context-aware technology use in foreign language learning. *Computer Assisted Language Learning*, 35(3), 294-318. http://dx.doi.org/10.1080/09588221.2019.1688836

Li, Y., Li, X., Su, Y., Peng, Y., & Hu, H. (2020). Exploring the role of EFL learners' online self-regulation profiles in their social regulation of learning in wiki-supported collaborative reading activities. *Journal of Computers in Education*, 7, 575-595. http://dx.doi.org/10.1007/s40692-020-00168-3

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. *Internet and Higher Education,* 29 (4), 40-48.

Liu, G. Z., Fathi, J., & Rahimi, M. (2024) Using digital gamification to improve language achievement, foreign language enjoyment, and ideal L2 self: A case of English as a foreign language learners. *Journal of Computer Assisted Learning*. https://doi.org/10.1111/jcal.12954

Liu, G. Z., & Hwang, G. J. (2010). A key step to understanding paradigm shifts in e-learning: towards context-aware ubiquitous learning. *British Journal of Educational Technology*, 41(2), E1-E9. http://dx.doi.org/10.1111/j.1467-8535.2009.00976.x

Liu, S. H. J., Lan, Y. J., & Ho, C. Y. Y. (2014). Exploring the relationship between self-regulated vocabulary learning and web-based collaboration. *Journal of Educational Technology & Society*, 17(4), 404-419.

Liu, G., & Ma, C. (2023). Measuring EFL learners' use of ChatGPT in informal digital learning of English based on the technology acceptance model. *Innovation in Language Learning and Teaching*, 1-14.

Liu, C. C., Wang, P. C., & Tai, S. J. D. (2016). An analysis of student engagement patterns in language learning facilitated by Web 2.0 technologies. *Recall*, 28(2), 104-122. http://dx.doi.org/10.1017/S095834401600001X

Lomicka, L., & Lord, G. (2016). Social media, digital tools, and learning: Student and faculty perceptions. *Journal of Literacy and Technology*, 17(1), 68-92.

Mahmoodi, M. H., Kalantari, B., & Ghaslani, R. (2014). Self-regulated learning (SRL), motivation and language achievement of Iranian EFL learners. *Procedia-Social and Behavioral Sciences*, *98*, 1062-1068.

Ma'ruf, Z., Fadilah, N., & Akmal, P. B. (2019). English Students' Perceptions of Using WhatsApp in Paragraph Writing Class. *International Journal of Scientific & Technology Research,* 8*(*10), 3055-3059.

McLoughlin, C., & Lee, M. J. (2010). Personalised and self-regulated learning in the Web 2.0 era: International exemplars of innovative pedagogy using social software. *Australasian Journal of Educational Technology*, 26(1). http://dx.doi.org/10.14742/ajet.1100

Mistar, I. B., & Embi, M. A. (2016). Students' perception on the use of WhatsApp as a learning tool in ESL classroom. *Journal of Education and Social Sciences,* 4, 96-104.

Munkaila, A., & Iddrisu, A. (2015). The impact of social net-worksites on the academic performance of students in the Polytechnics of Ghana. *International Journal of Economics, Commerce and Management,* 3(11), 1021-1035.

Najmi, K. (2015). The effect of mobile-assisted language learning (MALL) on guided writing skill of Iranian upper-intermediate EFL learners. *Journal of Applied Linguistics and Language Research,* 2(2), 42-52. http://dx.doi.org/10.29140/tltl.v2n1.140

Nurul Laili, R.N., & Nashir, M. (2021). Higher Education Students' Perception on Online Learning during Covid-19 Pandemic. *Edukatif: jurnal ilmu pendidikan,* 3(3), 689-697. http://dx.doi.org/10.31004/edukatif.v3i3.422

Palvia, S., Aeron, P., Gupta, P., Mahapatra, D., Parida, R., Rosner, R., & Sindhi, S. (2018). Online education: Worldwide status, challenges, trends, and implications. *Journal of Global Information Technology Management*, 21(4), 233-241. http://dx.doi.org/10.1080/1097198X.2018.1542262

Parmaxi, A., & Zaphiris, P. (2017). Web 2.0 in Computer-Assisted Language Learning: a research synthesis and implications for instructional design and educational practice. *Interactive Learning Environments*, 25(6), 704-716. http://dx.doi.org/10.1080/10494820.2016.1172243

Paris, S. G., & Paris, A. H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist*, 36(2), 89–101. http://dx.doi.org/10.1207/S15326985EP3602_4.

Patil, S., Deepthi, K., & Tadasad, P. G. (2015). Usage of WhatsApp messenger amongst post-graduate students in a University Environment: A study of Karnataka State Women's University, Vijayapura. *International Journal of Multidisciplinary Research and Development*, 2(11), 591–594.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451-502). Academic Press.

Quinones, OP & Charito, A. (2020). Students' perception of online learning during COVID-19 pandemic: A case study on the English students of STKIP Pamane Talino. *Journal of Social Sciences and Humanities*, 10(2), 225-235. http://dx.doi.org/10.31940/soshum.v10i2.1316

Radia, B. (2019). Approaching a reading course via Moodle-based blended learning: EFL learners' insights. *MJLTM*, 9(11), 700-721. http://dx.doi.org/10.26655/mjltm.2019.11.1

Rahimi, M., & Fathi, J. (2022). Exploring the impact of wiki-mediated collaborative writing on EFL students' writing performance, writing self-regulation, and writing self-efficacy: a mixed methods study. *Computer Assisted Language Learning*, 35(9), 2627-2674. http://dx.doi.org/10.1080/09588221.2021.1888753

Rosen, D., & Nelson, C. (2008). Web 2.0: A new generation of learners and education. *Computers in the Schools*, 25(3-4), 211-225. http://dx.doi.org/10.1080/07380560802370997

Şahin Kızıl, A., & Savran, Z. (2018). Assessing self-regulated learning: The case of vocabulary learning through information and communication technologies. *Computer Assisted Language Learning*, 31(5-6), 599-616. http://dx.doi.org/10.1080/09588221.2018.1428201

Salaway, G., Caruso, J.B. & Nelson, M.R. (2008). *The ECAR study of undergraduate students and* information *technology, 2008*. Boulder, CO: EDUCAUSE Center for Applied Research. http://www.educause.edu/ir/library/pdf/ERS0808/RS/ERS0808w.pdf

Salvo, S. G., Welch, B., & Shelton, K. (2019). African American males learning online: Promoting academic achievement in higher education. *Online Learning*, 23(1), 22–36. http://dx.doi.org/10.24059/olj.v23i1.1390.

Strauss, A.L. & Corbin, J. (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Sage Publications.

Stubbs, M. A., Martin, I., & Endlar, L. (2006). The structuration of blended learning: Putting holistic design principles into practice. *British Journal of Educational Technology*, 37(2), 163-175. http://dx.doi.org/10.1111/j.1467-8535.2006.00530.x

Tragant, E., Pinyana, À., Mackay, J., & Andria, M. (2022). Extending language learning beyond the EFL classroom through WhatsApp. *Computer Assisted Language Learning*, 35(8), 1946-1974. http://dx.doi.org/10.1080/09588221.2020.1854310

Vighnarajah, Wong, S. L., & Bakar, K. A. (2009). Qualitative findings of students' perception on practice of self-regulated strategies in online community discussion. *Computers & Education,* 53(1), 94-103. http://dx.doi.org/10.1016/j.compedu.2008.12.021

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language*. In A. Kozulin (Ed.), *Vygotsky in context* (pp. 11–56). Cambridge, MA: MIT.

Wang, S.H., & Vasquez, C. (2012). Web 2.0 and Second Language Learning: What Does the Research Tell Us? *CALICO Journal* 29(3),412-430. http://dx.doi.org/10.11139/cj.29.3.412-430.

Weissheimer, J., Caldas, V., & Marques, F. (2018). Using WhatsApp to develop L2 oral production. *[TESTE] Leitura*, 1(60), 21-38. http://dx.doi.org/10.28998/2317-9945.2018v1n60p21-38

Wicaksono, B. H., Ismail, S. M., Sultanova, S. A., & Abeba, D. (2023). I like language assessment: EFL learners' voices about self-assessment, self-efficacy, grit tendencies, academic resilience, and academic demotivation in online instruction. *Language Testing in Asia*, 13(1), 37. http://dx.doi.org/10.1186/s40468-023-00252-2

Wolters, C. A., & Hussain, M. (2015). Investigating grit and its relations with college students' self-regulated learning and academic achievement. *Metacognition and Learning*, 10(3), 293–311. https://doi.org/10.1007/s11409-014-9128-9.

Yot-Domínguez, C., & Marcelo, C. (2017). University students' self-regulated learning using digital technologies. *International Journal of Educational Technology in Higher Education,* 14(1), 1–18. https://doi.org/10.1186/s41239-017-0076-8.

Yu, A., & Trainin, G. (2022). A meta-analysis examining technology-assisted L2 vocabulary learning. *ReCALL*, 34(2), 235-252.

Yulia, H. (2020). Online Learning to Prevent the Spread of Pandemic Corona Virus in Indonesia. *English Teaching Journal*, 11(1), 48–56. https://doi.org/10.26877/eternal.v11i1.6068

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist,* 25(1), 3–17. https://doi.org/10.1207/s15326985ep2501_2.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). Academic Press.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64-70.

Appendix

Interview Questions

1. In your opinion, what are the biggest advantages and disadvantages of online learning compared to traditional classroom learning?
2. Can you describe a situation where technology either significantly enhanced or hindered your learning experience?
3. How do you feel about the role of collaboration in learning? Why do you think it's important or not important?
4. Imagine you could design your ideal learning environment. What key elements would it include?
5. What are some of the biggest challenges facing education today? How do you think we can address them?